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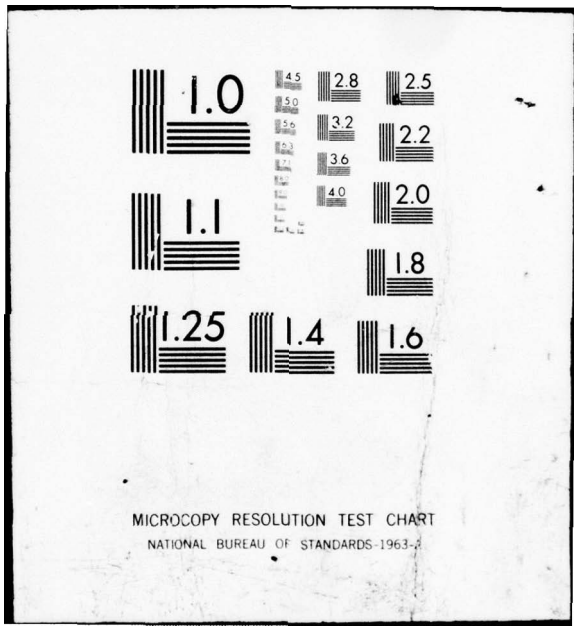
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REMOTELY PILOTED VEHICLE (RPV) STRUCTURAL COMPONENTS INVESTIGATION

Sam Yao, Dale P. Abildskov
FIBER SCIENCE, INC.
245 E. 157th Street
Gardena, Calif. 90248

February 1978

Final Report for Period June 1976 - May 1977

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Prepared for

APPLIED TECHNOLOGY LABORATORY
U. S. ARMY RESEARCH AND TECHNOLOGY LABORATORIES (AVRADCOM)
Fort Eustis, Va. 23604

APPLIED TECHNOLOGY LABORATORY POSITION STATEMENT

This report provides a reasonable insight into the advantages of the use of Spacewind for lightly loaded structures. The lack of fatigue test data, however, precludes the painting of a complete picture of the properties of Spacewind. Results of this contract are being integrated with other R&D efforts at the Applied Technology Laboratory to provide a comprehensive approach to the R&D required for development of future Army RPV aircraft systems.

Edward H. Dean, Structures Technical Area, Technology Applications Division, served as project engineer for this effort.

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The mechanical properties of the open-weave filament-wound material called "Spacewind" were evaluated both analytically and experimentally.

As a demonstration of the feasibility of using Spacewind, the body and wing for the AQUILA remotely piloted vehicle were designed, fabricated, tested, and proven successful.

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SUMMARY

The mechanical properties of Spacewind, an open-weave filament-wound material, were evaluated both analytically and experimentally.

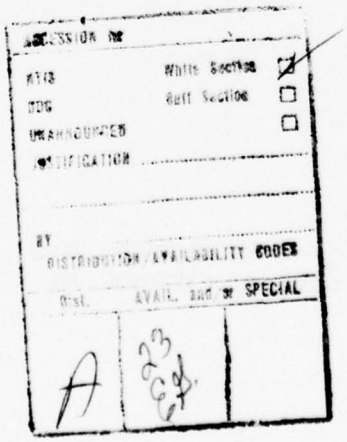
A computer program was developed for calculating the composite properties of a spacewind laminate based on the fiber and resin properties, fiber orientation, and fiber coverage ratio. The calculated values agree quite well with experimental values for graphite. However, poor correlation was found with S-glass and Kevlar 49. The test specimens failed in buckling, which accounts for the difference between calculated and measured strengths.

The test specimens were sandwich wall flexural panels having either Nomex honeycomb or PVC foam core material, and tubular tensile specimens. The sandwich wall panels were tested in flexure and for impact (ball drop).

The PVC foam core specimens were found to have higher impact resistance than the honeycomb and gave a much smoother surface. Graphite/epoxy faces proved to have much higher impact resistance than either glass or Kevlar 49.

Tubular tensile specimens, except for those made of graphite, were found to be unstable due to a lack of hoop strength and gave nonrealistic results.

As a demonstration of the feasibility of using Spacewind, the body and wing for the AQUILA remotely piloted vehicle were designed, fabricated, and tested. The body and wing sustained the ultimate design loads with no signs of failure. Spacewind filament-wound structural elements were proven to be practical. All of the objectives of the program were met.



PREFACE

This report was prepared by Fiber Science, Inc. in accordance with Contract DAAJ02-76-C-0040, issued by the Eustis Directorate, U.S. Army Air Mobility Research and Development Laboratory, Fort Eustis, Virginia*. Mr. Eddie Dean was the U.S. Army program technical monitor.

The activities reported herein cover the period from June 1976 to May 1977. The Fiber Science project engineer was Mr. Sam Yao

*Redesignated Applied Technology Laboratory, U.S. Army Research and Technology Laboratories (AVRADCOM), 1 September 1977.

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INTRODUCTION

This report is concerned with a filament winding technique developed by Fiber Science and called Spacewind. The name is descriptive -- spaces are left between filament wound strands. The final structure might have large spaces and appear to be made of a fish net. It might have smaller spaces and appear to be made of a loosely woven fabric.

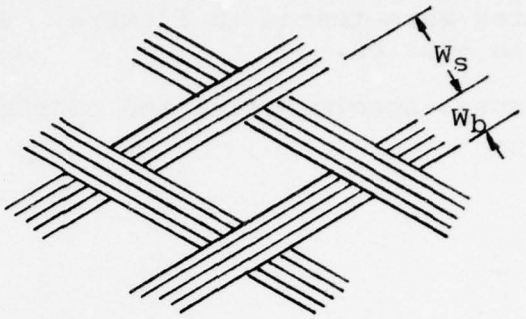
Spacewind is suitable mainly for lightly loaded structures. It is intended to minimize weight by leaving out material. It also reduces strength in some nonlinear fashion as material is left out.

One purpose of this contract was to devise an analytical model of how strength changes as the Spacewind parameters of open spaces and winding angle change. Another purpose was to verify the analytical model by specimen testing. Both the analytical model and specimen tests were to be verified by fabricating the fuselage and one wing of an RPV model and then subjecting the model to dead weight loading.

Filament winding is a well-known process. However, it has developed a unique vocabulary that is not so well known. The few definitions that follow will clarify some of the later text.

Strand	A general term indicating an essentially continuous length of filamentary material, whether large or small, twisted or untwisted.
Band Width	A single strand might be wound or several strands might be gathered and wound at one time. Band width is the width of the total number of strands wound at one time.
Winding Angle	Strands are wound onto a rotating mandrel by traversing from end to end of the mandrel. The angle between a strand and the mandrel axis is the winding angle. It is both + and - with reference to cartesian coordinates since the band direction changes.
F.C.R.	Fiber Coverage Ratio is the ratio of mandrel surface area covered with strands

going in one direction to the amount not covered, as sketched below.



$$F.C.R. = \frac{W_b}{W_b + W_s}$$

Fiber Volume — A second ratio, unrelated to F.C.R., is the ratio of fiber volume to the total volume of fiber and resin. It is typically given as a percentage rather than a ratio.

MATERIAL PROPERTY STUDIES

Mechanical properties of Spacewind panels and tubes were measured in order to verify analytical results. Sandwich panels using Spacewind faces and both honeycomb and PVC foam cores were tested in flexure. Spacewind tubes were tested in tension.

The flexural specimen size and configuration is shown in Figure 1.

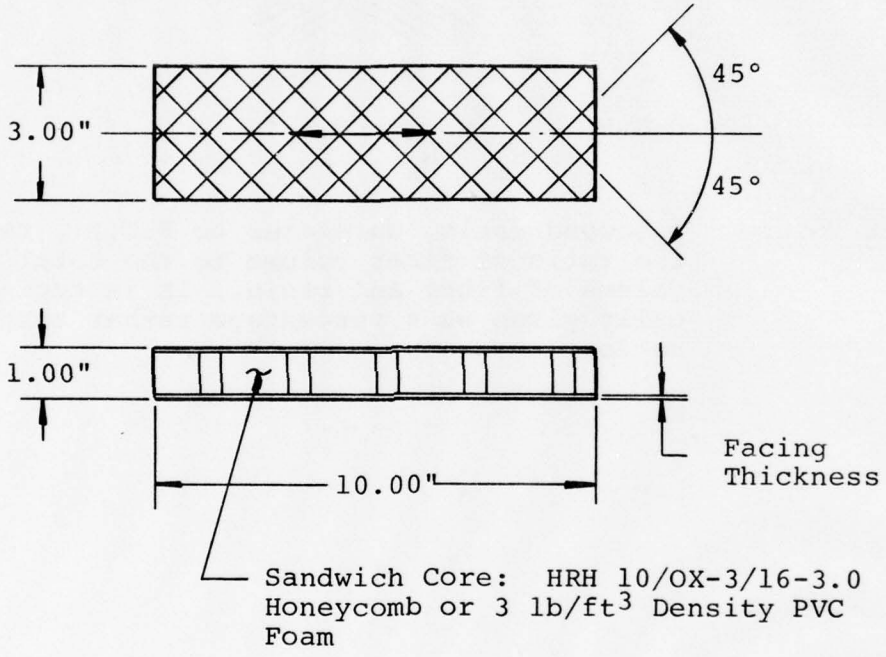


Figure 1. Flexural Test Specimen

Selected specimens had a half-inch-diameter hole drilled through both faces, exactly at the panel center, to give an evaluation of the effect of a cutout.

The facing materials used are given in Table 1. The resin system was APCO 2434/APCO 2347 7.5 phr (Applied Plastics Company, El Segundo, California).

Table 1. Reinforcing Fibers

Fiber Description	Band Width (inch)*	Facing Thickness (inch)**
S-2 glass, 12 end roving	.65	.012
Kevlar 49, 1420 denier	.44	.012
Thornel 300, 3000 filament strand	.44	.012

*100 percent coverage with 8 rovings

**50 percent fiber volume

Core materials were either Nomex honeycomb (HRH 10/OX-3/16-3.0) or PVC foam, both at 3 lb/cu. ft. density. The honeycomb is over-expanded, giving a rectangular cell instead of hexagonal. Over-expanding permits bending in one direction.

Samples made are given in Table 2. Three specimens of each configuration were made and tested.

Panels were tested according to Federal Test Method Standard No. 406, Method 1032. Facing stresses were calculated by:

$$F = \frac{P_B \, a_B}{4t(d+t_c)b}$$

where F = facing stress

P_B = total force, applied at 2 points located a distance of $a_B/4$ from each reaction

Table 2. Flexural Specimen Configurations

Fiber/Core Material	Fiber Coverage Ratio	Without Cutout	With Cutout
Glass/Nomex	1.00	X	
Glass/Nomex	.75	X	
Glass/Nomex	.50	X	
Glass/Nomex	.25	X	
Glass/Nomex	.50		X
Kevlar 49/Nomex	1.00	X	
Kevlar 49/Nomex	.75	X	
Kevlar 49/Nomex	.50	X	
Kevlar 49/Nomex	.25	X	
Kevlar 49/Nomex	.50		X
Kevlar 49/PVC Foam	.50	X	
Graphite/Nomex	1.00	X	
Graphite/Nomex	.75	X	
Graphite/Nomex	.50	X	
Graphite/Nomex	.25	X	
Graphite/Nomex	.50		X
Graphite/PVC Foam	.50	X	

a_B = span length

t = facing thickness

d = total sandwich thickness

t_c = core thickness

b = sandwich width

Results are given in Table 3.

Tensile strength and elongation at various winding angles was measured with a tubular specimen (Figure 2).

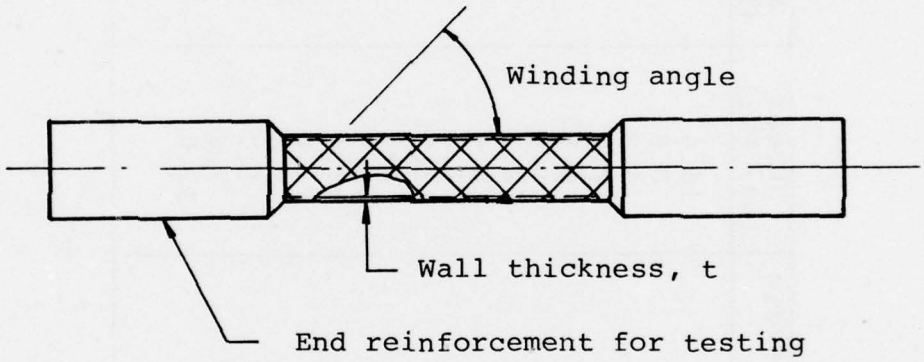


Figure 2. Tensile Test Specimen

The same fibers used for flexural panels were used for tensile specimens. Wall thicknesses were .014 inch for S-2 glass and .012 inch for Kevlar 49 and Thornel 300.

The samples made are given in Table 3. Three specimens of each configuration were made and tested.

Table 3. Flexural Specimen Test Results

Construction	Fiber Coverage Ratio	Stress (10^3 PSI)	Modulus (10^6 PSI)	Failure Strain (In./In.)	Failure Mode
S-2 Glass/Nomex	1.00	16.6	1.4	.011	D
S-2 Glass/Nomex	.75	8.8	1.2	.008	90° C
S-2 Glass/Nomex	.50	4.3	.48	.009	45° C
S-2 Glass/Nomex	.25	2.3	.34	.007	45° C
S-2 Glass/Nomex*	.50	4.65	.72	.007	45° C
S-2 Glass/Foam	.50	11.8	2.8	.004	90° C
Kevlar 49/Nomex	1.00	12.3	1.2	.011	D
Kevlar 49/Nomex	.75	8.4	.89	.010	90° C
Kevlar 49/Nomex	.50	4.3	.55	.008	90° C
Kevlar 49/Nomex	.25	2.35	.34	.007	90° C
Kevlar 49/Nomex*	.50	5.0	.72	.007	90° C
Kevlar 49/Foam	.50	11.9	1.2	.010	90° C
Graphite/Nomex	1.00	17.0	3.1	.009	D
Graphite/Nomex	.62	11.6	1.4	.011	D
Graphite/Nomex	.50	9.0	1.2	.009	90° C
Graphite/Nomex	.25	4.7	.66	.009	90° C
Graphite/Nomex*	.50	7.6	1.1	.007	45° C
Graphite/Foam	.50	12.0	2.1	.006	90° C

Note:

C denotes Compression
D denotes Delamination
* with cutout in specimen

Table 4. Tensile Specimen Configurations

Fiber Material	Fiber Coverage Ratio	Fiber Angle (Degrees)
S-2 Glass	1.00	20
	.25	20
	1.00	45
	.50	45
	.25	45
Kevlar 49	1.00	45
	.25	45
Thornel 300	1.00	45
	.25	45

Samples were tested according to Federal Test Method Standard No. 406, Method 1011, with one exception. The wall is supposed to be machined to 60 percent of the original wall thickness over a length of 2-1/4 inches to assure failure in the gage length. Spacewind samples are thicker at crossover points than between these points. Machining would hit only the crossovers and complicate the analysis.

Results are given in Table 5.

Inpact damage resistance was evaluated with a dropping ball test according to Federal Test Method Standard No. 406, Method 1074, with two exceptions: A 2.2-pound (2-1/2-inch diameter) steel ball was used instead of a .5-pound ball. The drop height was varied between 6 and 18 inches instead of 1 and 20 feet. The results, given in Table 6, are only comparative and do not have a design value.

Table 5. Tensile Specimen Test Results

Angle (Deg)	Fiber	Ratio	Stress (PSI)	Modulus (10^6 PSI)	Failure Strain (In./In.)	Failure Mode
20	Glass	1.00	87,500	3.0	.028	Shear
20	Glass	.25	53,300	.95	.10	Shear
45	Glass	1.00	22,500	1.5	.045	Shear
45	Glass	.50	15,400	.41	.030	Shear
45	Glass	.25	5,200	.21	.11	Shear
45	Kevlar	1.00	16,000	.95	.030	Shear
45	Kevlar	.25	7,500	.179	.057	Shear
45	Graphite	1.00	20,000	1.5	.025	Tensile
45	Graphite	.25	Could Not Test			

Table 6. Impact Test Results

Construction	Drop Height (In.)		
	6	12	18
S-2 glass, 1.00 coverage with honeycomb	No damage	No damage	1" fracture
S-2 glass, .50 coverage with honeycomb	No damage	3" fracture, delam.	Delam., 5" fracture in 3 directions
S-2 glass, .50 coverage with foam	Small dent	Dent	Dent, 2" fracture in 2 directions
Kevlar, .50 coverage with honeycomb	No damage	Dent, delam., 6" fracture	Dent, delam., skin to edges
Kevlar, .50 coverage with foam	Small Dent	Dent, delam.	Dent, delam., small fractures
Graphite, .50 coverage with honeycomb	No damage	6" delam.	8" delam.
Graphite, .50 coverage with foam	Small dent	Larger dent	Dent, small delam. opposite side

TEST RESULT ANALYSIS

Flexural test results are given in Table 3. Samples with foam cores were two to three times stronger than those with honeycomb cores. All samples except those at 1.00 ratio coverage (plus .62 for graphite) failed by skin buckling. The foam core gives 100% support to the windings to prevent buckling, whereas honeycomb gives much less support because it provides much less bonding surface. Foam core is preferred over honeycomb for this reason. It is also preferred for manufacturing convenience, as will be discussed later.

Cutouts had no effect on strength except possibly with graphite. The reason why graphite might respond to a cutout is not clear. Very probably there is no real difference between any of the cutout and plain panel pairs for statistical reasons. It is not unusual for the standard deviation to equal 20 percent of an average composed of only three test results. This point cannot be verified because of the few samples tested. Any future program should include samples for a statistical base line.

Tensile test results are given in Table 5. The samples were to be composed of only wound strands without any facing sheet or core material. The result was to fail all samples except 1.00 ratio coverage graphite in shear.

Flexural samples failed because of a face buckling instability. Tensile samples failed because of what might be called a lateral support instability. Since lateral support instability is not a recognized engineering term, it needs some explanation: The tubular tensile specimens are supported internally in the grip areas during test. The gage length has no support at all. The specimen wants to neck down as it is stretched, just as a scissors jack gets narrower as it goes higher. The winding angle changes as the specimen necks down, but the only restraint is the resin between strands. Resin shear strength is the lowest of all mechanical properties of composites. Specimens failed at a very low strength because only resin is being loaded.

If lateral support is given, for example by adding a core substrate or by winding a thick wall at 1.00 ratio coverage, the failure mechanism becomes tension rather than resin shear. Samples with a foam core to prevent lateral instability should be included in any future program.

Impact damage normally is measured by some type of pendulum device, such as an Izod test. Spacewind is not suitable for Izod testing because only the crossover points would be hit and the actual force would be much greater than the programmed force. A standard dropping ball test was used for this reason. Results are given in Table 6, page 17.

Foam core again gives more support than honeycomb core and is preferred. Delamination size is only a rough gage of impact damage.

ANALYTICAL RESULTS

A computer program was written to predict Spacewind mechanical properties. It is presented in Appendix A. The program assumed a failure mode of tension or compression. Test samples failed because of an instability, which indicates that the program should be valid only for stiffness, Poisson's ratio and coefficient of thermal expansion.

Figures 3 through 8 give calculated strength and stiffness of S-glass, Kevlar 49 and Thornel 300 Spacewind as a function of winding angle and fiber coverage ratio. Figures 9, 10 and 11 give correlations between calculated and measured results for flexural strength.

Graphite correlation is quite good, indicating that buckling failure of specimens occurred only very shortly before a tension or compression failure would have occurred.

Glass correlation is poor. All samples failed by buckling because of the low glass modulus, resulting in premature failures. Buckling is a function only of bond strength to the core. Plain winding resin was used as the adhesive for these samples. A better adhesive might delay buckling enough to improve correlation.

Kevlar correlates poorly also, in spite of its high tensile modulus. Tensile and compressive modulus normally are the same for fibers, but Kevlar is an exception. Relatively low compressive loads will cause Kevlar to split axially, leaving two or more filament fractions bunched together. Buckling failure follows immediately. Kevlar is demonstrating this splitting, or fibrilation, in the flexural buckling observed in test panels. However, the fiber compressive strength used to predict the composite properties appears to be too low.

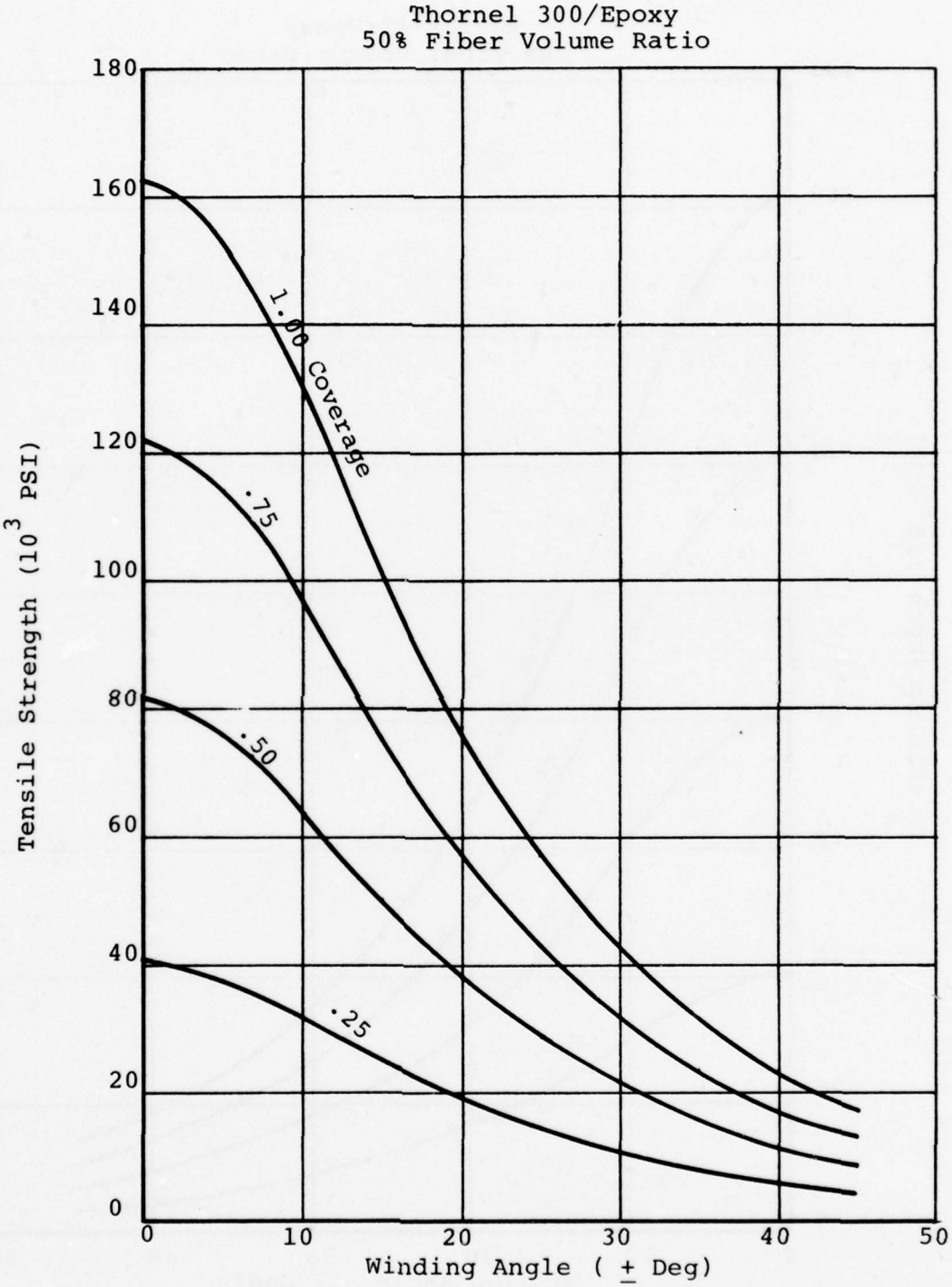


Figure 3. Thornel 300/Epoxy, Tensile Strength vs Winding Angle

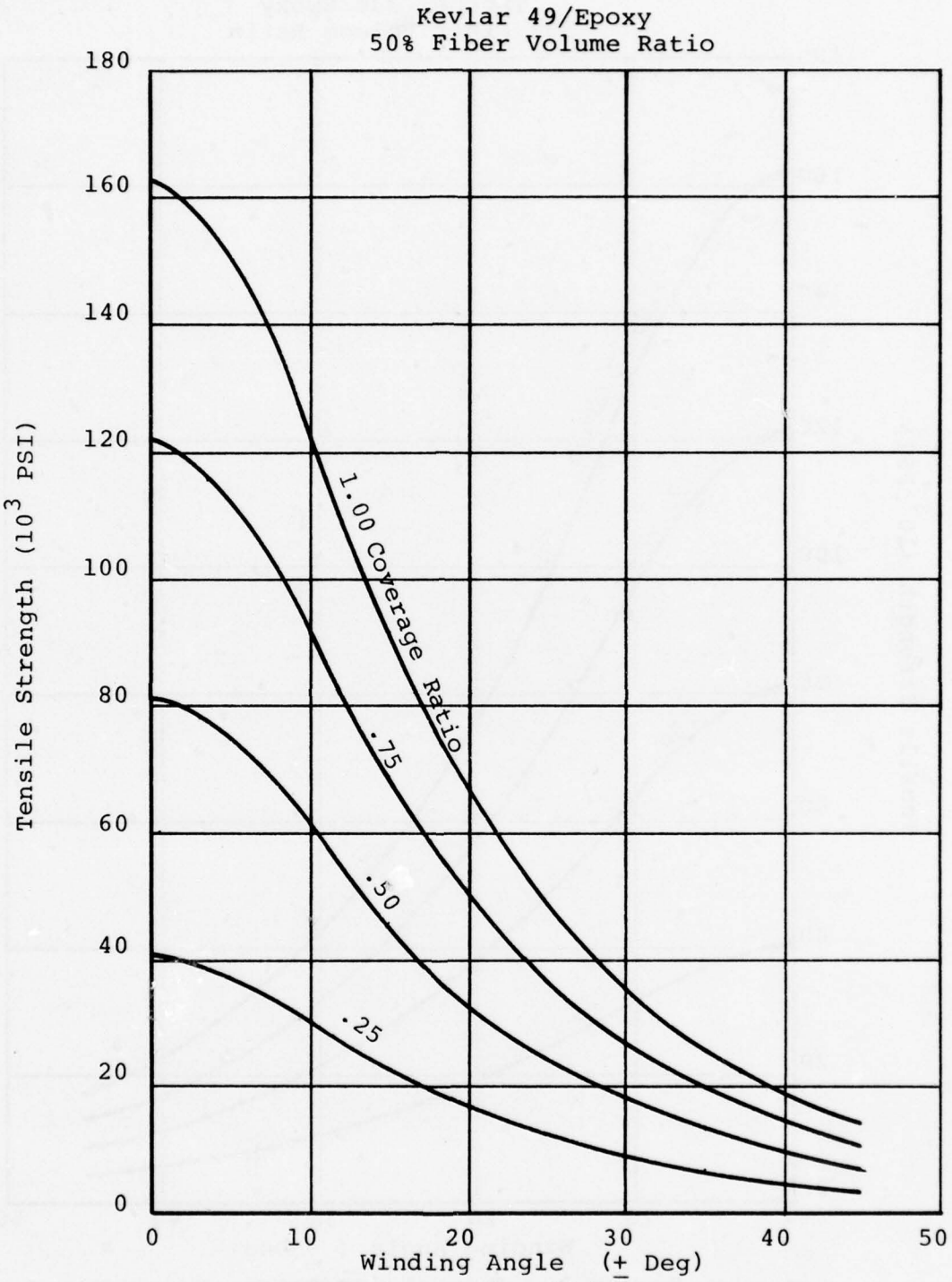


Figure 4. Kevlar 49/Epoxy, Tensile Strength vs Winding Angle

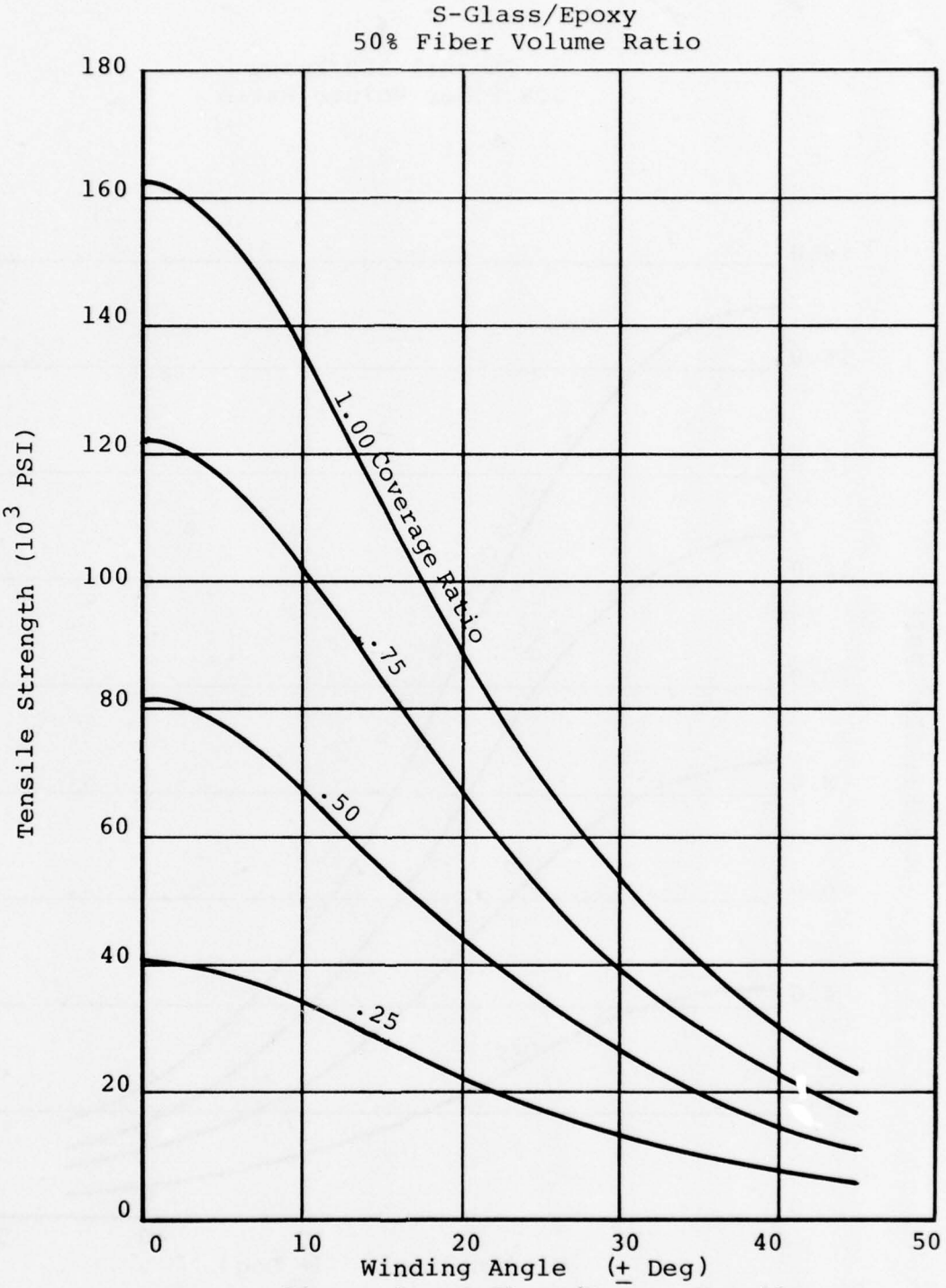


Figure 5. S-Glass/Epoxy, Tensile Strength vs Winding Angle

Thornel 300/Epoxy
50% Fiber Volume Ratio

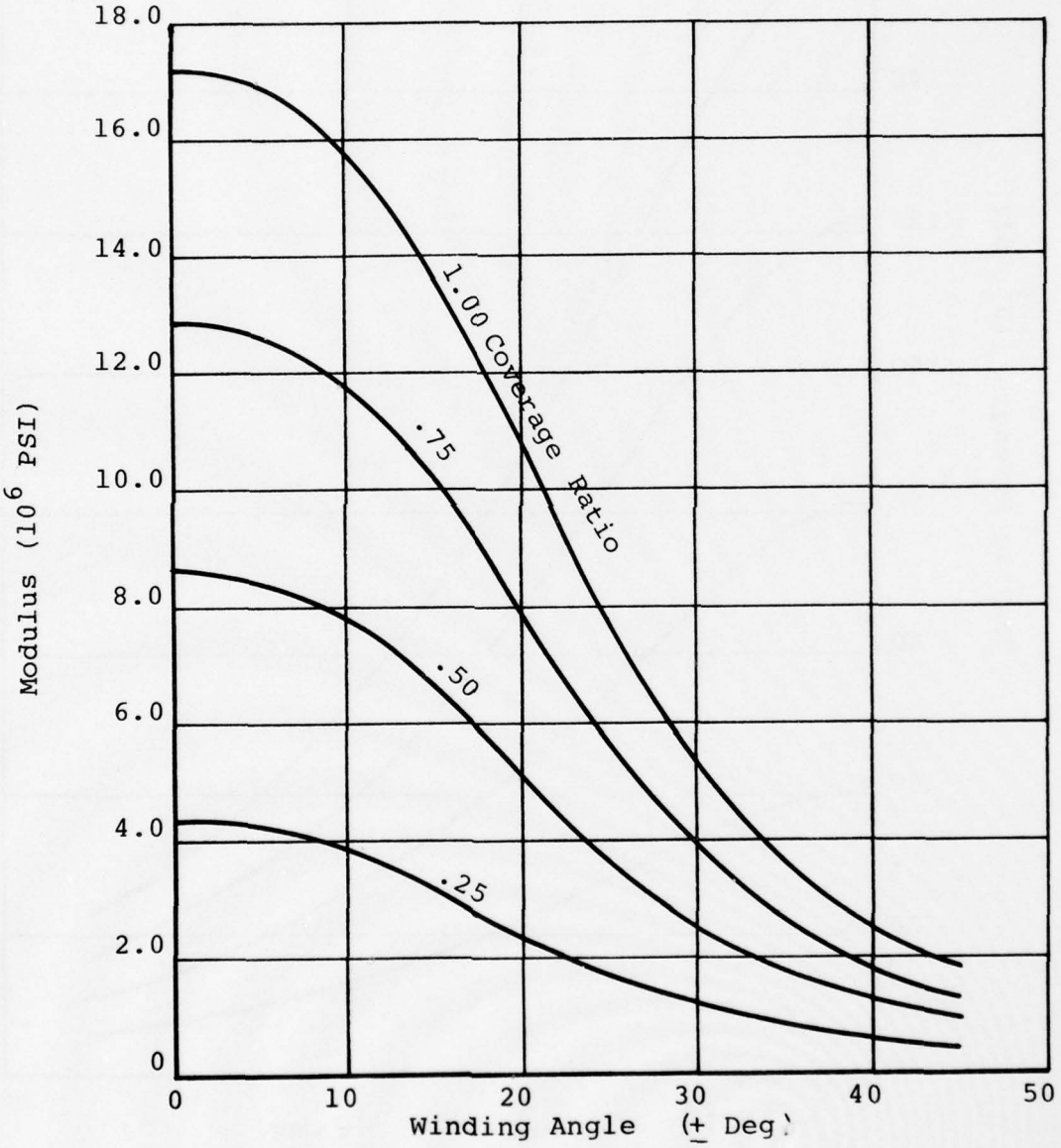


Figure 6. Thornel 300/Epoxy,
Modulus vs Winding Angle

Kevlar 49/Epoxy
50% Fiber Volume Ratio

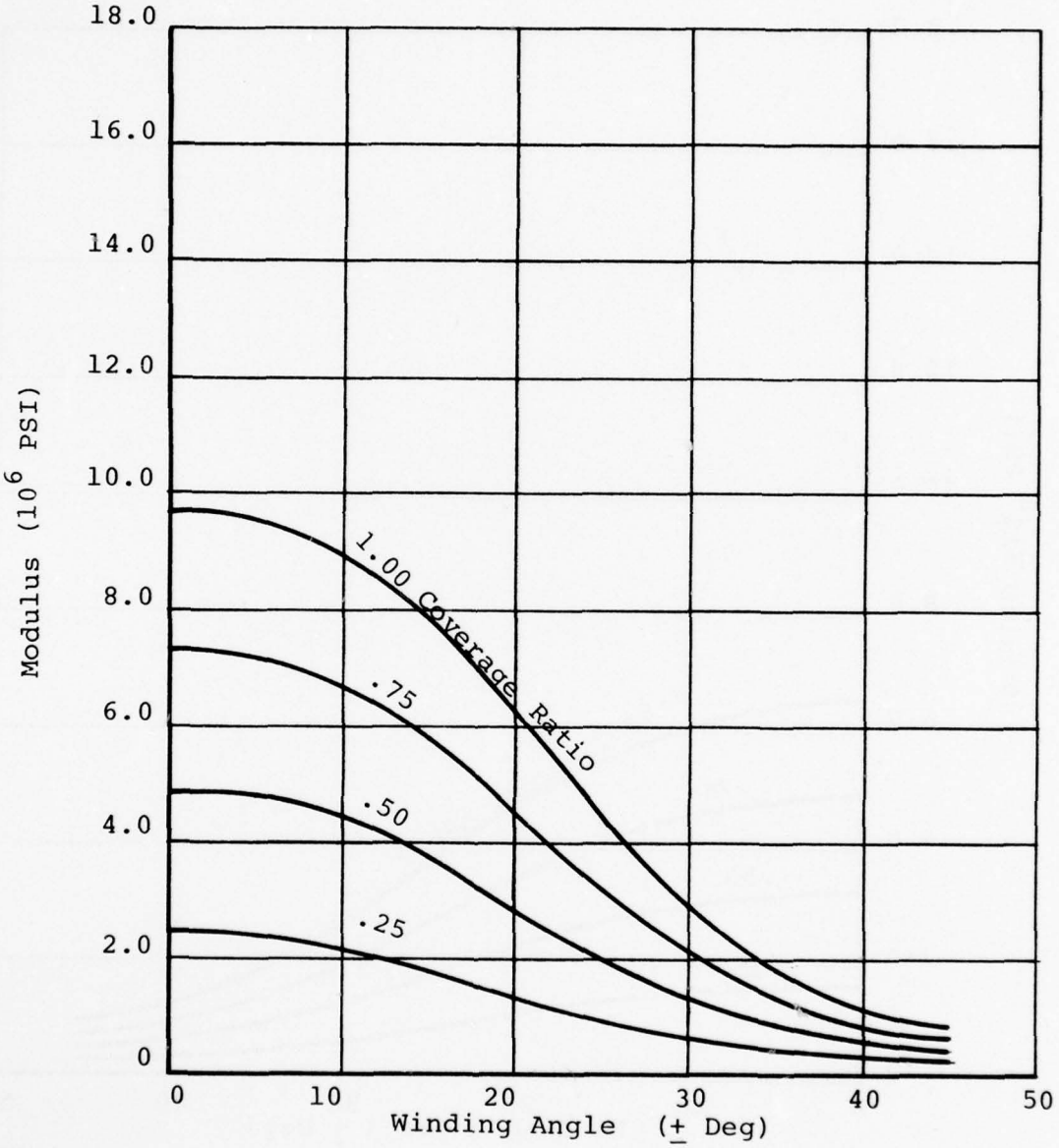


Figure 7. Kevlar 49/Epoxy, Modulus vs Winding Angle

S-Glass/Epoxy
50% Fiber Volume Ratio

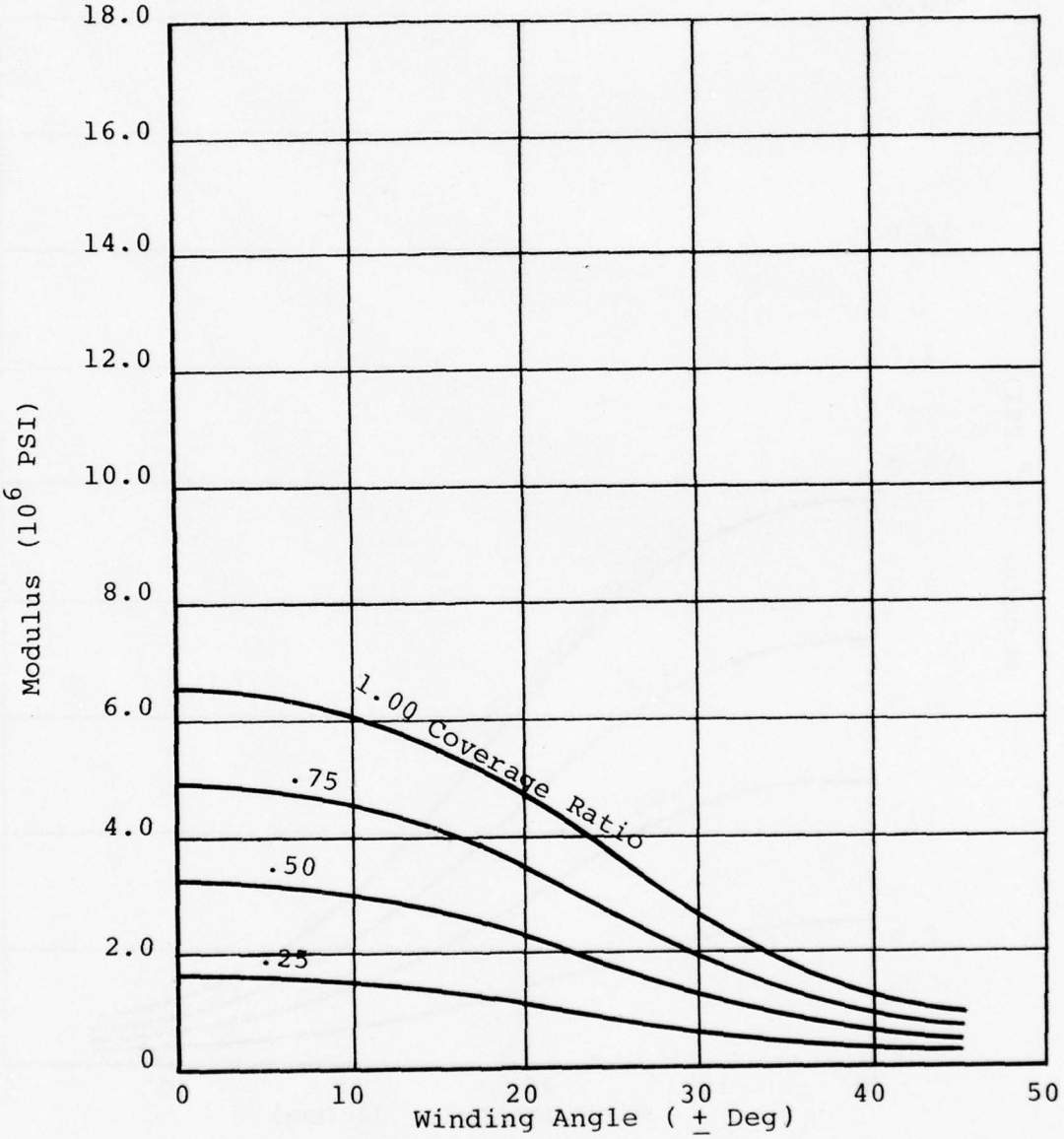


Figure 8. S-Glass/Epoxy, Modulus vs Winding Angle

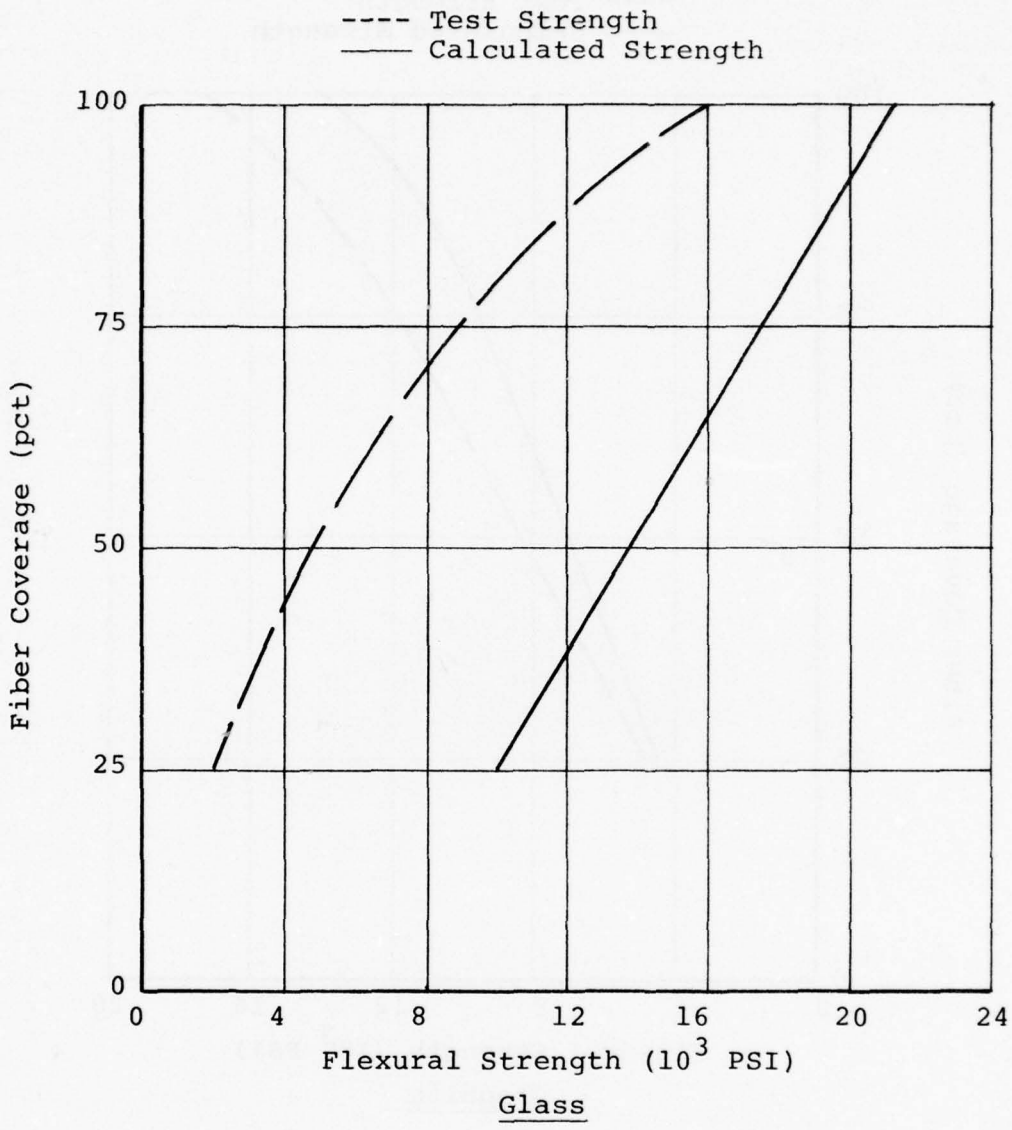


Figure 9. Correlation of Calculated & Measured Flexural Strength for Glass

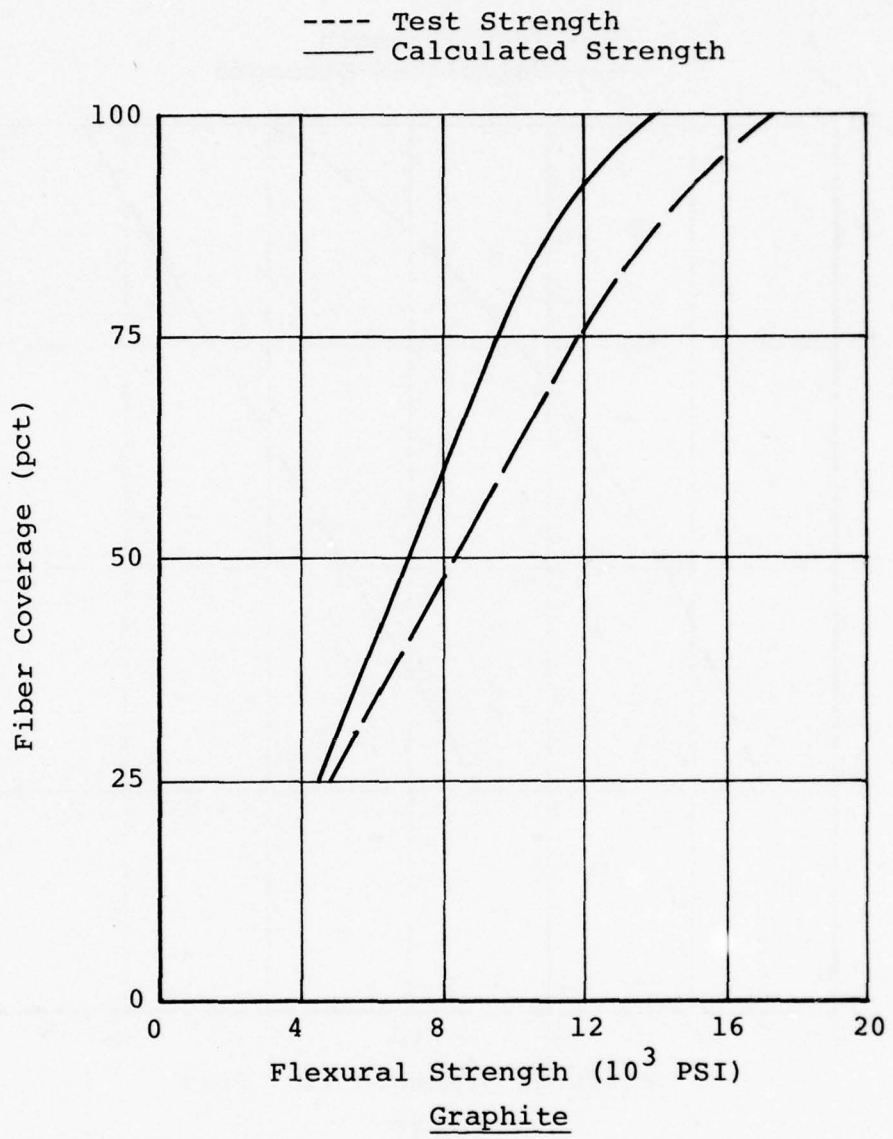


Figure 10. Correlation of Calculated & Measured Flexural Strength for Graphite

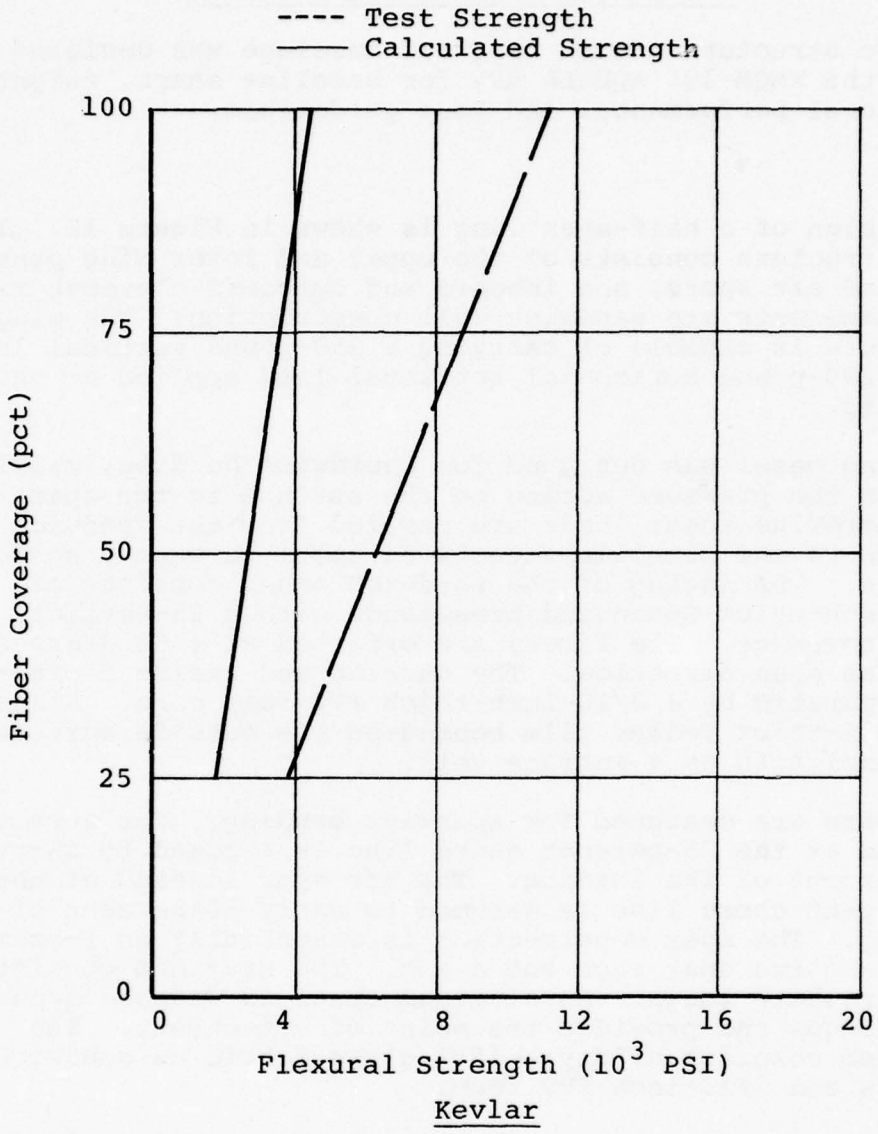


Figure 11. Correlation of Calculated & Measured Flexural Strength for Kevlar

RPV STRUCTURAL COMPONENT DESIGN

A basic structure of the wing and fuselage was designed using the XMQM-105 AQUILA RPV for baseline shape, weight, structural performance, and cost guidelines.

Wing

The design of a half-span wing is shown in Figure 12. The wing structure consists of the upper and lower wing panels, fore and aft spars, and inboard and outboard closeout ribs. All components are sandwich wall construction. The wing structure is capable of carrying a 350-pound vertical load and a 200-pound horizontal retrieval load applied at the wing tip.

The wing panel was designed for chordwise bending, mainly to beam the pressure acting on the surface to the spar. The chordwise shear loads are carried from the sandwich facings to the metallic attachment spool through a bonded surface. The facing of the sandwich panel consists of .014-inch-thick Spacewind broadgoods with a 25-percent fiber coverage. The fibers are oriented at $\pm$ 60 degrees from the span direction. The outside and inside facings are separated by a 3/16-inch-thick PVC foam core. A sheet of 1-mil-thick Tedlar film bonded on the outside surface of the panel acts as a surface veil.

The spars are designed for spanwise bending. The fore spar located at the 25-percent chord line is assumed to carry 100-percent of the loading. The aft spar located at the 70-percent chord line is assumed to carry 50-percent of the loading. The spar construction is essentially an I-beam. There are two spar caps and a web. The spar cap consists of a graphite longo. An aluminum spool is wrapped around with longos and provides the point of attachment. The spar web consists of Style 1581 glass fabric as sandwich facings and 3/16-inch PVC foam.

The closeout rib consists of glass fabric sandwich facings and PVC foam core.

Fuselage

The design of the fuselage is shown in Figure 13. The structure consists of a shell and two main bulkheads. The shell consists of graphite/epoxy facings and 3/16-inch-thick PVC foam core. The sandwich facing is Spacewind

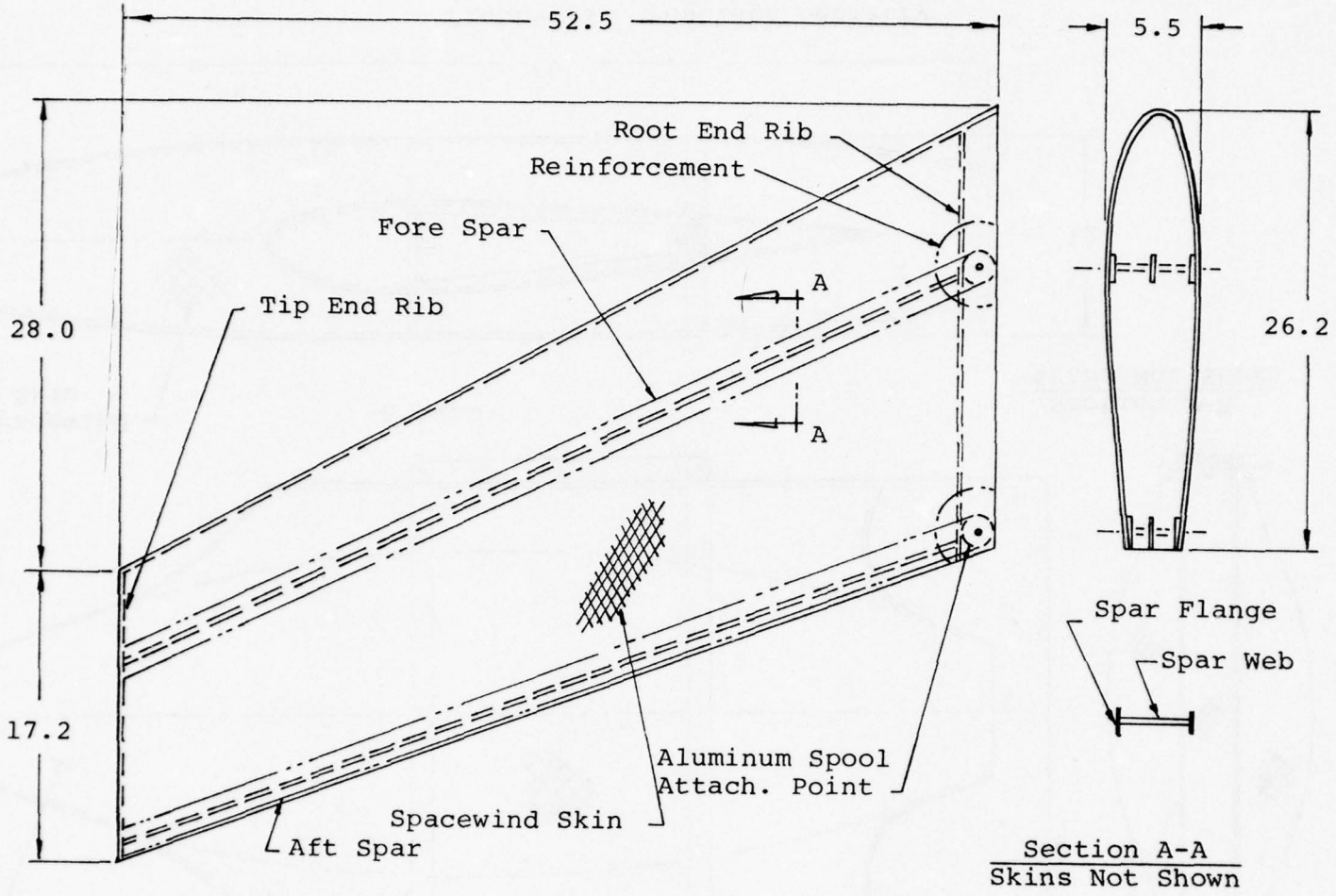


Figure 12. Wing Geometry

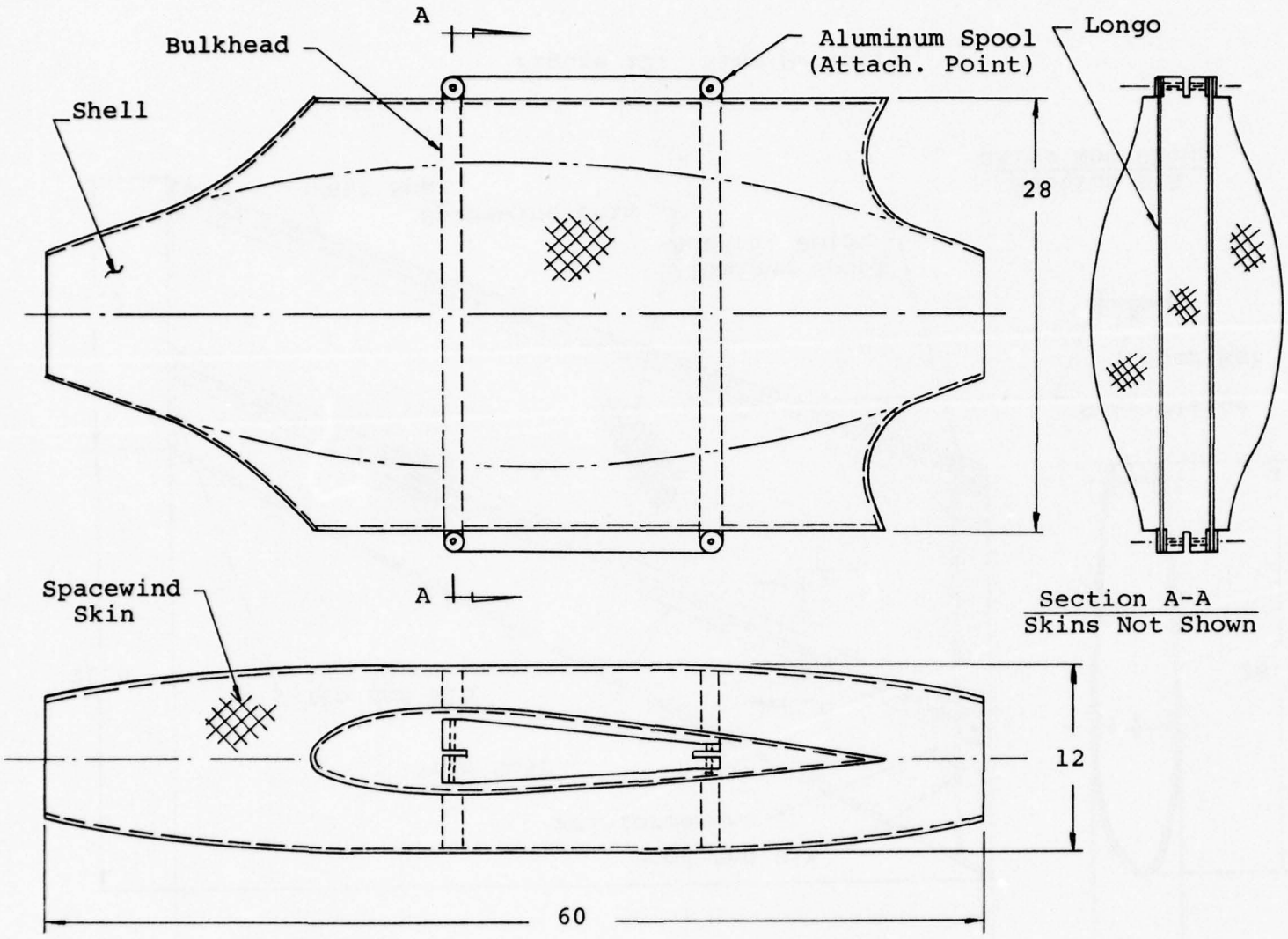


Figure 13. Fuselage Geometry

.014-inch-thick broadgoods with a 25-percent fiber coverage. The fibers are oriented at ± 45 degrees from the body axis. A sheet of Style 104 glass fabric is laminated on the outside of the shell as a surface veil.

The bulkheads are designed to carry the wing bending moment. The bulkhead consists of Spacewind graphite/epoxy facings and 3/4-inch-thick Spacewind broadgoods with 25-percent fiber coverage. The fibers are oriented at ± 45 degrees from the spanwise axis. Aluminum attachment spools at the upper and lower corners of both ends are wrapped with graphite longos. The longos tie the spool at one side to the spool at the other side of the fuselage to form a continuous beam element.

There is an end rib on the stub wing of each side of the fuselage. The rib is designed to distribute the fore and aft loads to the fuselage. Also, the rib is used as a link to tie the fore and aft bulkheads together at the attachment points to resist the loads in the chordwise direction.

The accessory mounting structure consists of partial bulkheads and intercostals. A shelf on the top of the structure provides the support for the accessory package.

The cutout and holes in Spacewind structures do not pose significant design problems. The opening is normally reinforced to carry the load.

Attachments

The wing to fuselage attachment was actually fabricated. Other attachments, such as payload, engine mount and control surfaces, were not fabricated. However, all attachments are based on one of three principles:

1. Use longos wrapped around spools.

2. Use a metal plate with attached bracket bonded to a vehicle surface.

3. Use a composite bulkhead bonded inside the fuselage.

The first attachment concept was used to join the wing and fuselage. The fuselage connection is made with graphite longitudinal (longo) fibers wrapped at two places on a set

of aluminum spools as sketched in Figure 14.

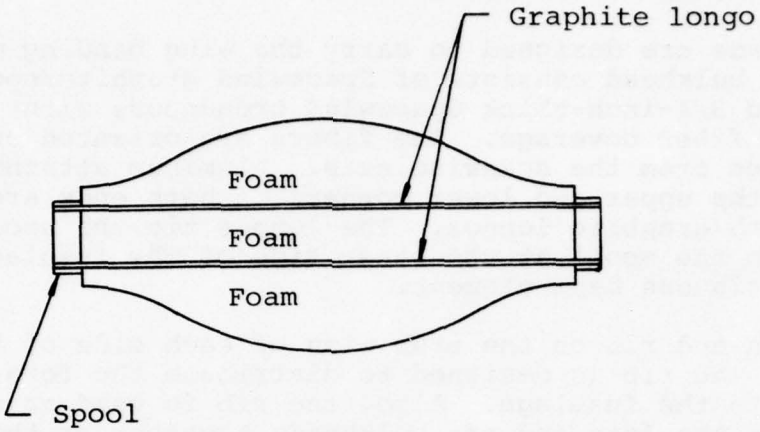


Figure 14. Fuselage Attachment for Wing

PVC foam is filled between the longos and on top and bottom as sketched and then Spacewind face sheets are bonded on. This assembly is a frame which is bonded inside the fuselage with the spools exposed on either side of the wing stub.

The wing matching joint is made by wrapping longos around a set of spools matched to the fuselage. Dummy spools are used at the wing tip end for winding, but then are cut off. The longos are bonded to the top and bottom inside skins as sketched in Figure 15.

Flanges on a wing spool go over the top of the mating fuselage spool and a single 1/4-inch bolt joins the two. In this manner, a load applied to one wing transfers to the opposite wing. Counter-acting loads, as normally would be experienced, are taken in tension and compression by the longos and transferred by shear through the fuselage bulkhead bond and longo bonds to the wings.

The payload attachment is a shelf made of foam core and

Spacewind faces, bonded horizontally at the proper nose position. The camera is bolted to this shelf and shoots through a hole cut in the shelf.

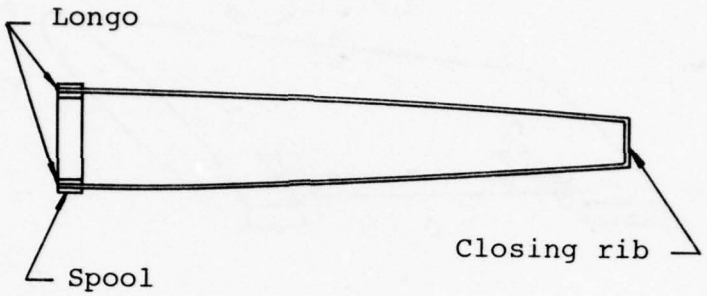


Figure 15. Wing Attachment for Fuselage

The engine mount is a similar shelf, this time called a fire wall, bonded vertically in the proper aft location. Mounting holes would have to be reinforced with a solid insert in the wall.

Control surfaces are simple elevons, pivoting at two places. Both places can utilize metal brackets which bond between the outer skin and core as sketched in Figure 16.

All attachments are designed the same as for standard composites.

Fatigue

Fatigue tests were not performed as part of this contract. However, previous experience with materials used in this contract indicates that fatigue life should be good and similar to conventional composites.

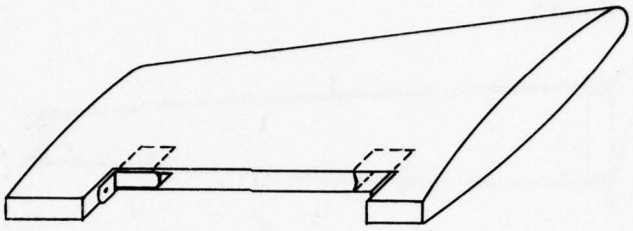


Figure 16. Control Surface Attachments

Damage Tolerance

Impact testing of panels with and without 1/2-inch-diameter holes indicates the hole has little or no effect. One can assume that ballistic damage would approximate this size hole and also have little or no effect.

Environmental Extremes

Environmental testing was not performed as part of this contract. Prior experience with the materials used indicate the normally assumed environmental conditions for aircraft, such as -50°F to +140°F temperature capability, can be met. It might be important to seal out moisture by using a Tedlar surface veil on both sides of the sandwich wall.

Weight

A weight analysis of a half-span wing was performed. The weight is 3.82 pounds. The weight breakdown is as follows:

Item	Material	Weight (lb)
Surface veil	Tedlar film	.12
Wing panel - skins	Graphite/epoxy	.60
- core	PVC foam	.80
- filler	Syntactic foam	.10
Longo spools	Aluminum	.20
Forward spar - caps	Graphite/epoxy	.30
- web	Glass fabric-PVC foam	.42
Aft spar - caps	Graphite/epoxy	.18
- web	Glass fabric-PVC foam	.24
Corner ties	Glass/epoxy	.62
Ribs	Glass fabric-PVC foam	.12
Bond liner	Epoxy	.12
	TOTAL	3.82

FABRICATION DEVELOPMENT

A model RPV fuselage and one wing were designed and fabricated to demonstrate techniques and feasibility. Design details are given on pages 30 through 37.

The procedure for all fabrication is to wind onto a cylindrical mandrel whatever coverage ratio and winding angle is needed. The mandrel is covered with a sheet of plastic. The winding and plastic sheet are cut axially and removed from the mandrel. The plastic sheet acts as a carrier and is removed after the Spacewind sheet is laminated into a mold.

Initial samples made as described above had quite a rough exterior surface because of the Spacewind configuration. The model was made with an exterior layer of 1-mil-thick bondable Tedlar film to give a good surface. It also gave better resin filleting at Spacewind crossover points.

Style 104 glass cloth was also evaluated as an outside surfacing material. It is better than Tedlar in that it will conform more readily to extreme changes in contour. However, it is also heavier and should be used only when Tedlar cannot conform to the desired contour.

Both honeycomb and PVC foam core materials were evaluated. Over expanded honeycomb will bend in one direction but not two. Extensive slitting and patching is necessary to fit it over compound contours. PVC foam can be thermally formed to most contours and is preferred for this reason. Structural reasons mentioned earlier also give a preference to foam over honeycomb.

A detailed fabrication sequence is given in the following section.

FABRICATION SEQUENCE

The basic structure of a left wing and fuselage of the AQUILA RPV was fabricated to the Spacewind specifications. The fabrication procedures were as follows:

Wing Panel

1. Prepare mold surface for bonding.

2. Apply a 1-mil-thick bondable Tedlar film on the mold half. Draw a vacuum between the film and the mold surface. Rub out wrinkles and remove the trapped air.

3. Laminate a Spacewind outside skin on top of the Tedlar film with the skin carrier film facing up. Work the spacewind skin to conform to the mold surface. Remove the skin carrier film.

4. Install the pre-formed PVC foam core.

5. Laminate the Spacewind inside skin on top of the foam core with skin carrier film facing up. Work spacewind skin to conform to the shape.

6. Apply a vacuum bag. Draw a vacuum and rub out.

7. Cure.

8. Remove vacuum bag and the inside skin carrier film.

9. Trim to size.

Fuselage Shell

Repeat steps to fabricate wing panels, except replace Tedlar film with one ply of Style 104 E-glass fabric/epoxy laid into the mold wet and rubbed out as a contact layup.

Fuselage Bulkhead, Spar Web and Rib

1. Apply a release film on the surface table. Draw a vacuum and rub out the wrinkles.

2. Laminate the sandwich facing on the release film.

3. Install the sandwich core.

4. Laminate the sandwich facing.

5. Apply a vacuum bag. Draw a vacuum and rub out the wrinkles.

6. Cure.

7. Remove the vacuum bag and release film.

8. Trim to size.

Spar Longo

1. Prepare the aluminum spools for bonding.

2. Rig the aluminum spools in the winding fixture.

3. Wind longos around the grooves of the aluminum spools.

4. Remove the winding from the fixture.

5. Cut the longo to length.

6. Install the longo to the inside surface of the wing panel while it is supported on the wing mold. Align the spool and the longo per the drawing location.

7. Apply a vacuum bag and rub out.

8. Cure.

9. Remove the vacuum bag.

Bulkhead Longo

1. Prepare the aluminum spools for bonding.

2. Rig up the spools on the bulkhead.

3. Wind the longo around the groove of the spool.

4. Apply the vacuum bag and rub out.

5. Cure.

6. Remove the vacuum bag.

Wing Assembly

1. Place the lower wing panel on the mold.
2. Apply adhesive to all the bonding surfaces -- leading and trailing edges, fore and aft spar web locations.
3. Apply the adhesive to the upper and lower edges of the spar webs.
4. Install the spar webs to the lower wing panel.
5. Install the upper wing panel. Use weights to hold the wing panel down.
6. Cure.
7. Apply a cap ply to the leading edge split line.
8. Install inboard and outboard ribs.
9. Cure.

Fuselage Assembly

1. Place the lower shell in the mold.
2. Apply adhesive to all the bonding surfaces -- edges of shell, fore and aft bulkhead locations.
3. Apply adhesive to the upper and lower edges of the bulkheads.
4. Install the bulkheads in the lower shell.
5. Install the upper shell. Use weights to hold the shelf half in place.
6. Cure.
7. Bond end ribs on both sides.
8. Final cure.

RPV STRUCTURAL COMPONENT TESTING

The Spacewind fuselage and wing assembly successfully passed the structural test of 700 pounds total wing load without any sign of failure. The test was set up as depicted in Figure 17. Loading was accomplished using 25-pound bags of lead shot placed on the upper surface of the left wing and the simulated right wing. The wings were loaded simultaneously and symetrically by placing weights uniformly spaced along the 25-percent chord of both wings. 350-pound loads were applied to each wing. The deflection of the wing tip was 1.03 inches under full load.

Thumb pressure tests on the wing surface and fuselage shell were conducted. The wing surface was found to be much stiffer than that of the existing AQUILA wing. No comparison was made on the fuselage because the existing AQUILA fuselage was not available.

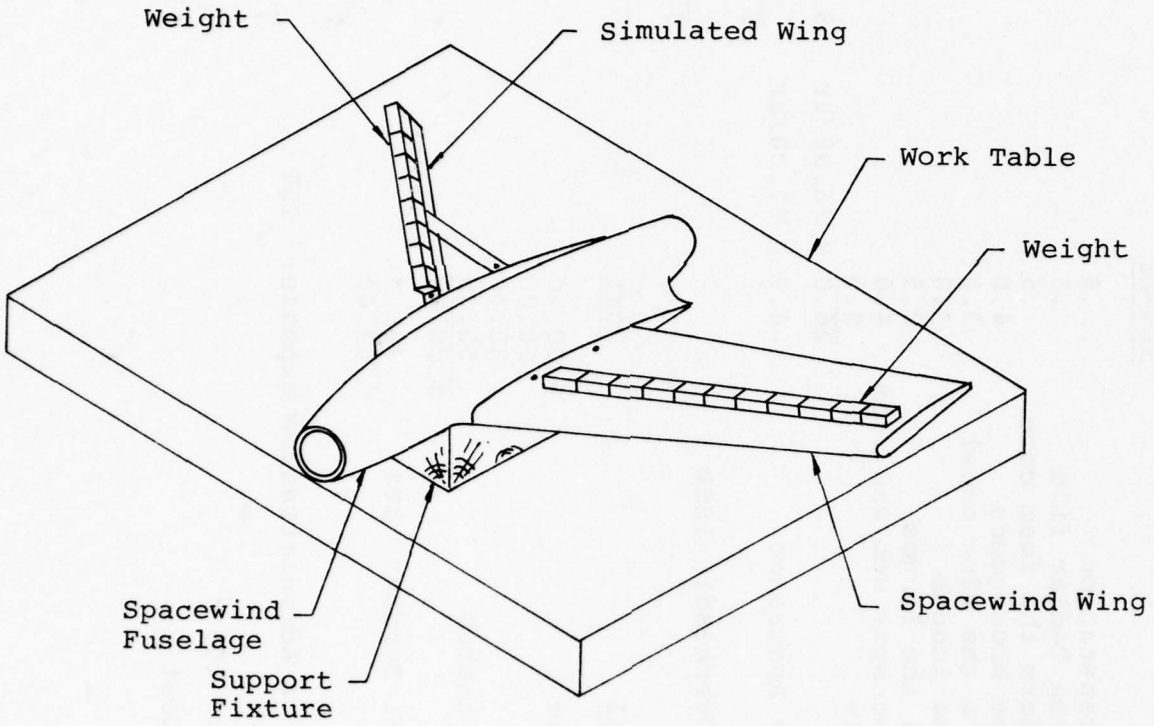


Figure 17. Test Setup

RPV STRUCTURAL COMPONENT COST ANALYSIS

The cost estimate for production of Spacewind RPV structural components is shown below.

Basic Wing Structure

Labor	Man-hr		
Mold preparation	.5		
Apply the Tedlar film	.5		
Thermoform the foam core	.5		
Wind the broadgoods	4.0		
Laminate the wing panel	3.0		
Wind the longos	3.0		
Install the longos	2.5		
Fab. the spar web and ribs	4.0		
Assembly	8.0		
	26.0	@ $6.00/hr	$ 156.00
Quality Assurance	4.0	@ $7.00/hr	28.00
			$ 184.00
Labor Overhead: 125%			230.00
			$ 414.00

Material	Cost	
Graphite	$200.00	
Resin	50.00	
Foam	30.00	
Miscellaneous	50.00	
	$330.00	
Material Burden: 10%	33.00	
	$363.00	363.00
		$ 777.00
General & Administrative Expense: 25%		194.00
		$ 971.00
Profit: 10%		97.00
Total Cost		$1,068.00

Basic Fuselage Structure

Labor	Man-hr			
Mold preparation	.5			
Apply the Tedlar film	.5			
Thermoform the foam core	1.0			
Wind the broadgoods	4.0			
Laminate the shell	3.0			
Wind the longo	2.0			
Install the longo	2.5			
Fabricate the bulkheads	4.0			
Assembly	8.0			
	25.5	@	$6.00/hr	$ 153.00
Quality Assurance	4.0	@	$7.00/hr	28.00
				$ 181.00
Labor Overhead: 125%				226.00
				$ 407.00

Material	Cost	
Graphite	$200.00	
Resin	50.00	
Foam	30.00	
Miscellaneous	50.00	
	$330.00	
Material Burden: 10%	33.00	
	$363.00	363.00
		$ 770.00
General & Administrative expense: 25%		193.00
		$ 963.00
Profit: 10%		96.00
Total Cost		$1,059.00

CONCLUSIONS

The model RPV structure fabricated withstood all required loads, was of allowable weight, and presented no manufacturing problems. It was totally successful.

There were problems in sample testing. Hindsight indicates tensile test samples should have had a foam core to represent more nearly the end application.

Flexural panels failed predominately by buckling. Better adhesion between the core and Spacewind face and a stiffer core will retard or eliminate buckling.

Correlation between the computer model and test results was good for graphite, fair for Kevlar, and poor for glass. The computer model assumes that failure was caused by tension, compression or shear. Samples failed by an instability mechanism. There is reasonable doubt whether correlation problems are caused by computer model errors or test result errors. Since the scale model RPV sustained all required loads and since it was designed according to analytical methods, the evidence favors the computer model being reasonably accurate.

APPENDIX A
COMPUTER PROGRAM AND PRINT OUT

```
      PROGRAM SWPROP(INPUT,OUTPUT,TAPE5=INPUT,TAPE6=OUTPUT)
      DIMENSION HEAD(16)
    1 READ(5,2)(HEAD(I),I=1,16)
    2 FORMAT(16A5)
      IF(EOF,5)11,4
    4 READ(5,5)VF,UF,UR,RHOF,RHOR,EF,EFT,GF,ER,FTU,FCU,FSU,AF,AFT,AR
    5 FORMAT(5F10.4/4E10.3,8F10.0/3E10.3)
      CK=.25
      VR=1.-VF
      WF=VF*RHOF/(VF*RHOF+VR*RHOR)
      WR=1.-WF
      FT=FTU
      FC=FCU
      FTU=FTU*VF
      FCU=FCU*VF
    6 CC=.25
      RHO=(VF*RHOF+(1.-VF)*RHOR)*CK
      WRITE(6,10)HEAD
   10 FORMAT(1H1,16A5)
      WRITE(6,8)CK
    8 FORMAT(5X,22HFIBER COVERAGE RATIO =F5.3/)
      WRITE(6,11)
   11 FORMAT(5X,16HFIBER PROPERTIES,22X,16HRESIN PROPERTIES,22X,20HCOMPO
     1SITE PROPERTIES/)
      WRITE(6,12)VF,EF,VR,ER,RHO,WF,EFT,WR,AR,FTU,RHOF,GF,RHOR,UR,FCU,FT
     1 ,AF,FSU,FSU,FC,AFT,UF
   12 FORMAT(5X,5HVF   =F6.4,8X,4HEF =E10.3,5X,5HVR  =F6.4,8X,4HER =E10.3
     1,5X,4HRHO=F6.4/5X,5HWF  =F6.4,8X,4HEFT=E10.3,5X,5HWR  =F6.4,8X,4HA
     2R =E10.3,5X,4HFTU=F9.1/5X,5HRHOF=F6.4,8X,4HGF =E10.3,5X,5HRHOR=F6.
     34,8X,4HUR =F6.4,9X,4HFCU=F9.1/5X,5HFTU =F9.1,5X,4HAF =E10.3,5X,5HF
     4SU =F9.1,24X,4HFSU=F9.1/5X,5HFCU =F9.1,5X,4HAFT=E10.3/5X,5HUF  =F6
     5.4/)
      WRITE(6,15)
   15 FORMAT(129H   ALPHA       EX          EY          GXY         UXY
     1 UYX       FXTU       FYTU       FXCU       FYCU       FXY       AX
     2       AY/)
      A=0.
   20 CONTINUE
      A=A/57.29578
      S1=SIN(A)
      S2=S1**2
      S3=S1*S2
      S4=S2**2
      C1=COS(A)
      C2=C1**2
      C3=C1*C2
      C4=C2**2
      S2A=SIN(2.*A)
      C2A=COS(2.*A)
      ULT=UF*VF+UR*(1.-VF)
      SVF=SQRT(VF)
      EL=EF*VF+(1.-VF)*ER
      EC=EFT
      G=SVF
```

```
 ET=((C*EC+(1.-C)*ER)*ER)/(C*ER+(1.-2.*UR**2)*(1.-C)*(C*EC+(1.-C)*
1ER))*CK
 ULT=ULT*ET/EL
 U=1.-ULT*ULT
 GR=ER/(2.*(1.+UR))
 GLT=GR*(GF*C+GR*(1.-C))/((1.-C)*(GF*C+GR*(1.-C))+GR*C)
 B11   =1./U*(EL*C4+ET*S4+(2.*EL*ULT+4.*U*GLT)*S2*C2)
 B22   =1./U*(ET*C4+EL*S4+(2.*EL*ULT+4.*U*GLT)*S2*C2)
 B33   =1./U*((EL+ET-2.*EL*ULT)*S2*C2+U*GLT*(C2-S2)**2)
 B12   =1./U*((EL+ET-4.*U*GLT)*S2*C2+EL*ULT*(C4+S4))
 B13   =1./U*((ET-EL*ULT-2.*U*GLT)*S3*C1-(EL-EL*ULT-2.*U*GLT)*S1*C3
1)
 B23   =1./U*((ET-EL*ULT-2.*U*GLT)*S1*C3-(EL-EL*ULT-2.*U*GLT)*S3*C1
1)
 EX=(B11-B12**2/B22)*CK
 EY=(B22-B12**2/B11)*CK
 UXY=B12/B22
 UYX=B12/B11
 GXY=B33*CK
 THERMAL EXPANSION CALCULATIONS
 E1=EL/(C4+EL*S4/ET+.25*(EL/GLT-2.*ULT)*S2A*S2A)
 E2=EL/(S4+EL*C4/ET+.25*(EL/GLT-2.*ULT)*S2A*S2A)
 G12=EL/(1.+2.*ULT+EL/ET-(1.+2.*ULT+EL/ET-EL/GLT)*C2A*C2A)
 U12=E1/EL*(ULT-.25*(1.+2.*ULT+EL/ET-EL/GLT)*S2A*S2A)
 U21=U12*E2/E1
 B1=S2A*(2.*ULT+EL/ET-.5*EL/GLT-C2*(1.+2.*ULT+EL/ET-EL/GLT))
 B2=S2A*(2.*ULT+EL/ET-.5*EL/GLT-S2*(1.+2.*ULT+EL/ET-EL/GLT))
 E1B=EL/(EL/E1-B1*B1*G12/EL)
 E2B=EL/(EL/E2-B2*B2*G12/EL)
 U21B=E2B/EL*(U21*EL/E2+B1*B2*G12/EL)
 U12B=E1B/EL*(U12*EL/E1+B1*B2*G12/EL)
 G12B=EL*(1.-U12*U21)/(EL*(1.-U12*U21)/G12-B1*E1/EL*(B1+U21*B2)-B2*
1E2/EL*(B2+U12*B1))
 AL=(AM*(1.-VF)*ER+AF*VF*EF)/EL
 B=SQRT(VF/3.1415926)
 AO=AR*(1.-2.*B)+2.*AFT*B-UR*(AFT-AR)*(1.-2.*B)
 EO=ER*EFT/(EFT*(1.-2.*B)+2.*ER*B)
 AT=(AO*EO*B+AR*ER*(1.-B))/ET
 A1=AL*C2+AT*S2
 A2=AL*S2+AT*C2
 A12=2.*(AT-AL)*S1*C1
 A1B=A1-A12*B1*G12/EL
 A2B=A2-A12*B2*G12/EL
 STRENGTH CALCULATIONS
 PSI=U
 U1=1./(8.*PSI)*(EL+ET+ULT*EL+ULT*ET)
 U2=1./(2.*PSI)*(PSI*GLT-.5*(ULT*EL+ULT*ET))
 U3=1./(2.*PSI)*(EL-ET)
 U4=1./(8.*PSI)*(EL+ET-(ULT*EL+ULT*ET)-4.*PSI*GLT)
 Q11L=3.*U1+U2+U3+U4
 Q12L=U1-U2-U4
 Q22L=3.*U1+U2-U3+U4
 Q66L=U1+U2-U4
 Q1AM=3.*U1+U2-U3+U4
 Q12M=U1-U2-U4
```

```
      Q22M=3.*U1+U2+U3+U4
      Q66M=U1+U2-U4
      Q11N=3.*U1+U2+U3*COS(2.*A)+U4*COS(4.*A)
      Q12N=U1-U2-U4*COS(4.*A)
      Q22N=3.*U1+U2-U3*COS(2.*A     )+U4*COS(4.*A)
      Q66N=U1+U2-U4*COS(4.*A)
      RQ11=Q11N
      RQ12=Q12N
      RQ22=Q22N
      RQ66=Q66N
      FXCU=FCU*(RQ11*RQ22-RQ12*RQ12)/(Q11L*RQ22-Q12L*RQ12)*CK
      FYCU=FCU*(RQ11*RQ22-RQ12*RQ12)/(Q22M*RQ11-Q12M*RQ12)*CK
      A=.785398-A
      Q11N=3.*U1+U2+U3*COS(2.*A)+U4*COS(4.*A)
      Q12N=U1-U2-U4*COS(4.*A)
      Q22N=3.*U1+U2-U3*COS(2.*A     )+U4*COS(4.*A)
      Q66N=U1+U2-U4*COS(4.*A)
      RQ11=Q11N
      RQ12=Q12N
      RQ22=Q22N
      RQ66=Q66N
      FSCU=FCU*(RQ11*RQ22-RQ12*RQ12)/(Q11L*RQ22-Q12L*RQ12)*CK
      A=.785398-A
      ET=0.
      ULT=0.
      UTL=0.
      PSI=1.
      U1=1./(8.*PSI)*(EL+ET+UTL*EL+ULT*ET)
      U2=1./(2.*PSI)*(PSI*GLT-.5*(UTL*EL+ULT*ET))
      U3=1./(2.*PSI)*(EL-ET)
      U4=1./(8.*PSI)*(EL+ET-(UTL*EL+ULT*ET)-4.*PSI*GLT)
      Q11L=3.*U1+U2+U3+U4
      Q12L=U1-U2-U4
      Q22L=3.*U1+U2-U3+U4
      Q66L=U1+U2-U4
      Q11M=3.*U1+U2-U3+U4
      Q12M=U1-U2-U4
      Q22M=3.*U1+U2+U3+U4
      Q66M=U1+U2-U4
      Q11N=3.*U1+U2+U3*COS(2.*A)+U4*COS(4.*A)
      Q12N=U1-U2-U4*COS(4.*A)
      Q22N=3.*U1+U2-U3*COS(2.*A     )+U4*COS(4.*A)
      Q66N=U1+U2-U4*COS(4.*A)
      RQ11=Q11N
      RQ12=Q12N
      RQ22=Q22N
      RQ66=Q66N
      FXTU=FTU*(RQ11*RQ22-RQ12*RQ12)/(Q11L*RQ22-Q12L*RQ12)*CK
      FYTU=FTU*(RQ11*RQ22-RQ12*RQ12)/(Q22M*RQ11-Q12M*RQ12)*CK
      A=.785398-A
      Q11N=3.*U1+U2+U3*COS(2.*A)+U4*COS(4.*A)
      Q12N=U1-U2-U4*COS(4.*A)
      Q22N=3.*U1+U2-U3*COS(2.*A     )+U4*COS(4.*A)
      Q66N=U1+U2-U4*COS(4.*A)
      RQ11=Q11N
      RQ12=Q12N
      RQ22=Q22N
      RQ66=Q66N
      FSTU=FTU*(RQ11*RQ22-RQ12*RQ12)/(Q11L*RQ22-Q12L*RQ12)*CK
      FXY=FSTU/((1.+(FSTU/FSCU)**2+FSTU/FSCU)**.5)/2.
      A=.785398-A
      A=A*57.295827
      WRITE(6,50)A,EX,EY,GXY,UXY,UYX,FXTU,FYTU,FXCU,FYCU,FXY,A13,A28
   50 FORMAT(1X,F7.2,3E12.3,2F8.4,5F10.1,2E12.3)
      A=A+1.
      IF(A-46.)20,100,100
  100 CK=CK+CC
      IF(CK-1.)6,6,105
  105 GO TO 1
  110 STOP
      END
```

MATERIAL PROPERTY COMPUTER OUTPUT NOMENCLATURE

AF	Fiber thermal expansion coefficient, in/in/F°
AFT	Fiber Transverse thermal expansion coefficient, in/in/F°
ALPHA	Winding angle relative to "x" axis, deg.
AR	Resin thermal expansion coefficient, in/in/F°
AX	Composite thermal expansion coefficient in x-direction, in/in/F°
AY	Composite thermal expansion coefficient in y-direction, in/in/F°
EF	Fiber modulus, psi
EFT	Fiber transverse modulus, psi
ER	Resin modulus, psi
EX	Composite modulus in x-direction, psi
EY	Composite modulus in y-direction, psi
FCU	Fiber or composite compressive strength, psi
FSU	Resin or composite shear strength, psi
FTU	Fiber or composite tensile strength, psi
FXCU	Composite compressive strength in x-direction, psi
FXTU	Composite tensile strength in x-direction, psi
FXY	Composite shear strength, psi
FYCU	Composite compressive strength in y-direction, psi
FYTU	Composite tension strength in y-direction, psi
GF	Fiber shear modulus, psi
GXY	Composite shear modulus, psi
RHO	Composite density, lb/in^3
RHOF	Fiber density, lb/in^3
UF	Fiber Poisson's ratio
UR	Resin Poisson's ratio
UXY	Composite Poisson's ratio
UYX	Composite Poisson's ratio
VF	Fiber volume ratio

VR	Resin volume ratio
WF	Fiber weight ratio
WR	Resin weight ratio

THORNEL 300/E OXY -SPACEWIND-
FIBER COVERAGE RATIO = .250

FIBER PROPERTIES

VF = .5000
WF = .6069
RHOF= .0636
FTU = 325000.0
FCU = 215000.0
UF = .2200

EF = 3.400E+07
EFT= 1.300E+06
GF = 3.500E+06
AF =-2.400E-07
AFT= 2.960E-06

RESIN PROPERTIES

VR = .5000
WR = .3931
RHOR= .0412
FSU = 8000.0

ER = 4.700E+05
AR = 4.000E-05
UR = .3500

COMPOSITE PROPERTIES

RHO= .0131
FTU= 162500.0
FCU= 107500.0
FSU= 8000.0

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	4.309E+06	5.485E+04	1.274E+05	.2858	.0036	40625.0	.0	26875.0	341.7	983.3	3.087E-07	7.427E-05
1.00	4.306E+06	5.497E+04	1.286E+05	.3055	.0039	40520.6	1.5	26857.4	342.5	1045.6	2.889E-07	7.408E-05
2.00	4.296E+06	5.534E+04	1.320E+05	.3663	.0047	40210.4	5.9	26803.0	344.8	1111.9	2.300E-07	7.352E-05
3.00	4.279E+06	5.595E+04	1.378E+05	.4652	.0061	39702.9	13.2	26706.6	348.6	1182.6	1.337E-07	7.261E-05
4.00	4.253E+06	5.682E+04	1.459E+05	.5987	.0080	39011.9	23.5	26560.6	354.0	1257.9	2.746E-09	7.135E-05
5.00	4.218E+06	5.793E+04	1.562E+05	.7620	.0105	38155.4	36.7	26355.3	361.0	1338.4	-1.594E-07	6.979E-05
6.00	4.171E+06	5.930E+04	1.687E+05	.9490	.0135	37154.3	53.0	26080.1	369.5	1424.3	-3.484E-07	6.796E-05
7.00	4.111E+06	6.093E+04	1.834E+05	1.1528	.0171	36031.5	72.3	25725.0	379.6	1516.0	-5.596E-07	6.588E-05
8.00	4.037E+06	6.281E+04	2.001E+05	1.3657	.0212	34810.8	94.7	25281.6	391.4	1614.1	-7.882E-07	6.361E-05
9.00	3.949E+06	6.496E+04	2.188E+05	1.5797	.0260	33515.5	120.2	24744.8	404.8	1719.0	-1.029E-06	6.118E-05
10.00	3.845E+06	6.738E+04	2.393E+05	1.7872	.0313	32167.8	148.8	24113.2	419.9	1831.3	-1.277E-06	5.863E-05
11.00	3.727E+06	7.008E+04	2.617E+05	1.9812	.0373	30788.1	180.7	23389.8	436.7	1951.5	-1.528E-06	5.600E-05
12.00	3.596E+06	7.307E+04	2.857E+05	2.1557	.0438	29394.8	215.9	22582.0	455.4	2080.2	-1.778E-06	5.331E-05
13.00	3.454E+06	7.634E+04	3.113E+05	2.3062	.0510	28003.5	254.5	21701.2	475.8	2218.0	-2.022E-06	5.061E-05
14.00	3.303E+06	7.992E+04	3.383E+05	2.4296	.0588	26627.6	296.5	20761.7	498.1	2365.6	-2.257E-06	4.791E-05
15.00	3.145E+06	8.381E+04	3.666E+05	2.5245	.0673	25278.1	342.0	19779.5	522.3	2523.7	-2.481E-06	4.524E-05
16.00	2.984E+06	8.802E+04	3.961E+05	2.5909	.0764	23963.5	391.2	18771.1	548.6	2692.9	-2.690E-06	4.262E-05
17.00	2.822E+06	9.256E+04	4.266E+05	2.6299	.0863	22690.4	444.2	17752.8	576.9	2873.8	-2.883E-06	4.005E-05
18.00	2.661E+06	9.744E+04	4.580E+05	2.6436	.0968	21463.6	501.0	16739.0	607.4	3067.2	-3.058E-06	3.756E-05
19.00	2.502E+06	1.027E+05	4.901E+05	2.6347	.1081	20286.4	561.7	15742.5	640.1	3273.7	-3.213E-06	3.516E-05
20.00	2.349E+06	1.083E+05	5.227E+05	2.6061	.1202	19160.7	626.6	14773.8	675.1	3493.6	-3.348E-06	3.284E-05
21.00	2.201E+06	1.143E+05	5.558E+05	2.5610	.1330	18087.5	695.8	13840.7	712.6	3727.5	-3.461E-06	3.062E-05
22.00	2.059E+06	1.207E+05	5.891E+05	2.5024	.1467	17066.7	769.4	12949.1	752.7	3975.5	-3.552E-06	2.849E-05
23.00	1.925E+06	1.276E+05	6.225E+05	2.4331	.1612	16097.9	847.6	12102.7	795.4	4237.7	-3.620E-06	2.645E-05
24.00	1.799E+06	1.349E+05	6.558E+05	2.3557	.1766	15179.8	930.5	11303.8	840.9	4513.7	-3.666E-06	2.452E-05
25.00	1.680E+06	1.426E+05	6.889E+05	2.2723	.1929	14310.9	1018.5	10552.9	889.3	4802.9	-3.688E-06	2.267E-05
26.00	1.568E+06	1.509E+05	7.215E+05	2.1850	.2102	13489.5	1111.6	9849.8	940.9	5104.2	-3.687E-06	2.092E-05
27.00	1.464E+06	1.597E+05	7.536E+05	2.0954	.2285	12713.7	1210.1	9193.2	995.7	5416.1	-3.662E-06	1.927E-05
28.00	1.367E+06	1.69 E+05	7.850E+05	2.0048	.2478	11981.3	1314.3	8581.4	1053.9	5736.4	-3.614E-06	1.769E-05
29.00	1.277E+06	1.789E+05	8.155E+05	1.9142	.2682	11290.2	1424.4	8012.2	1115.8	6062.4	-3.541E-06	1.621E-05
30.00	1.193E+06	1.894E+05	8.450E+05	1.8246	.2897	10638.3	1540.7	7483.3	1181.6	6391.0	-3.444E-06	1.488E-05
31.00	1.115E+06	2.006E+05	8.733E+05	1.7366	.3124	10023.4	1663.5	6992.2	1251.5	6718.3	-3.322E-06	1.367E-05
32.00	1.043E+06	2.125E+05	9.003E+05	1.6506	.3364	9443.6	1793.1	6536.4	1325.7	7040.2	-3.176E-06	1.222E-05
33.00	9.756E+05	2.251E+05	9.259E+05	1.5671	.3616	8896.7	1929.9	6113.4	1404.5	7352.4	-3.004E-06	1.104E-05
34.00	9.132E+05	2.385E+05	9.499E+05	1.4863	.3882	8380.9	2074.2	5720.8	1488.3	7650.5	-2.808E-06	9.919E-06
35.00	8.553E+05	2.528E+05	9.723E+05	1.4085	.4163	7894.4	2226.5	5356.4	1577.3	7930.2	-2.585E-06	8.867E-06
36.00	8.014E+05	2.679E+05	9.928E+05	1.3336	.4458	7435.3	2387.1	5018.0	1671.9	8187.8	-2.335E-06	7.875E-06
37.00	7.514E+05	2.840E+05	1.012E+06	1.2618	.4769	7002.0	2556.5	4703.5	1772.6	8420.4	-2.059E-06	6.941E-06
38.00	7.049E+05	3.011E+05	1.028E+06	1.1930	.5096	6593.0	2735.2	4411.1	1879.6	8625.7	-1.755E-06	6.062E-06
39.00	6.616E+05	3.193E+05	1.043E+06	1.1273	.5441	6206.8	2923.8	4139.1	1993.6	8802.4	-1.422E-06	5.235E-06
40.00	6.212E+05	3.387E+05	1.055E+06	1.0645	.5804	5841.9	3122.8	3885.8	2114.9	8950.1	-1.060E-06	4.457E-06
41.00	5.836E+05	3.594E+05	1.066E+06	1.0047	.6186	5497.2	3332.7	3649.8	2244.2	9069.1	-6.670E-07	3.726E-06
42.00	5.486E+05	3.814E+05	1.074E+06	.9476	.6588	5171.3	3554.3	3429.8	2382.0	9160.1	-2.427E-07	3.041E-06
43.00	5.158E+05	4.049E+05	1.080E+06	.8933	.7011	4863.2	3788.3	3224.5	2529.1	9224.1	2.143E-07	2.398E-06
44.00	4.852E+05	4.299E+05	1.083E+06	.8416	.7456	4571.7	4035.4	3032.7	2686.0	9262.0	7.055E-07	1.795E-06
45.00	4.566E+05	4.567E+05	1.084E+06	.7924	.7924	4296.0	4296.4	2853.4	2853.7	9274.6	1.232E-06	1.231E-06

THORNEL 300/EPOXY -SPACEWIND-
FIBER COVERAGE RATIO = .375

FIBER PROPERTIES				RESIN PROPERTIES				COMPOSITE PROPERTIES	
VF = .5000	EF = .340E+08			VR = .5000	ER = .470E+06			RHO= .0197	
WF = .6469	EFT= .130E+07			WR = .3931	AR = .400E-04			FTU= 162500.0	
RHOF= .0636	GF = .350E+07			RHOR= .0412	UR = .3500			FCU= 107500.0	
FTU = 325000.0	AF = -.240E-06			FSU = 8000.0				FSU= 8000.0	
FCU = 215000.0	AFT= .296E-05								
UF = .2200									

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	.6463E+07	.1234E+06	.1911E+06	.2850	.0054	60937.5	-.0	40312.5	768.5	1476.8	.3087E-06	.4951E-04
1.00	.6458E+07	.1236E+06	.1928E+06	.2988	.0057	60780.9	2.2	40286.2	769.5	1569.7	.2955E-06	.4963E-04
2.00	.6444E+07	.1240E+06	.1981E+06	.3397	.0065	60315.5	8.8	40205.7	772.5	1669.0	.2561E-06	.4920E-04
3.00	.6419E+07	.1248E+06	.2068E+06	.4069	.0079	59554.3	19.8	40065.7	777.5	1775.3	.1913E-06	.4881E-04
4.00	.6383E+07	.1260E+06	.2190E+06	.4987	.0098	58517.9	35.2	39858.4	784.5	1889.0	.1021E-06	.4827E-04
5.00	.6333E+07	.1274E+06	.2345E+06	.6127	.0123	57233.1	55.1	39573.4	793.6	2010.9	-.9838E-08	.4759E-04
6.00	.6269E+07	.1292E+06	.2533E+06	.7459	.0154	55731.4	79.5	39198.9	804.7	2141.6	-.1427E-06	.4678E-04
7.00	.6188E+07	.1313E+06	.2754E+06	.8947	.0190	54047.3	108.5	38722.7	817.9	2281.7	-.2943E-06	.4584E-04
8.00	.6088E+07	.1338E+06	.3005E+06	1.0549	.0232	52216.2	142.0	38133.5	833.3	2432.1	-.4621E-06	.4479E-04
9.00	.5969E+07	.1366E+06	.3286E+06	1.2217	.0280	50273.2	180.2	37422.4	850.8	2593.6	-.6435E-06	.4364E-04
10.00	.5830E+07	.1398E+06	.3596E+06	1.3902	.0333	48251.7	223.2	36583.7	870.6	2767.0	-.8358E-06	.4239E-04
11.00	.5671E+07	.1433E+06	.3932E+06	1.5552	.0393	46182.2	271.1	35616.3	892.6	2953.2	-.1036E-05	.4107E-04
12.00	.5492E+07	.1472E+06	.4294E+06	1.7121	.0459	44092.1	323.9	34524.1	917.0	3153.2	-.1241E-05	.3968E-04
13.00	.5296E+07	.1515E+06	.4679E+06	1.8565	.0531	42005.2	381.7	33316.4	943.8	3368.0	-.1449E-05	.3824E-04
14.00	.5084E+07	.1562E+06	.5086E+06	1.9847	.0610	39941.5	444.7	32007.1	973.2	3598.5	-.1656E-05	.3675E-04
15.00	.4860E+07	.1613E+06	.5512E+06	2.0939	.0695	37917.1	513.0	30614.3	1005.1	3845.7	-.1860E-05	.3524E-04
16.00	.4627E+07	.1669E+06	.5956E+06	2.1823	.0787	35945.2	586.8	29158.8	1039.7	4110.7	-.2058E-05	.3370E-04
17.00	.4388E+07	.1729E+06	.6415E+06	2.2492	.0886	34035.6	666.2	27662.8	1077.2	4394.4	-.2248E-05	.3215E-04
18.00	.4146E+07	.1794E+06	.6888E+06	2.2946	.0993	32195.4	751.4	26148.4	1117.6	4697.5	-.2428E-05	.3059E-04
19.00	.3906E+07	.1863E+06	.7371E+06	2.3192	.1106	30429.6	842.6	24636.7	1161.0	5020.8	-.2595E-05	.2905E-04
20.00	.3670E+07	.1938E+06	.7863E+06	2.3247	.1228	28741.0	940.0	23146.3	1207.7	5364.7	-.2748E-05	.2751E-04
21.00	.3440E+07	.2018E+06	.8361E+06	2.3128	.1357	27131.2	1043.7	21693.3	1257.7	5729.4	-.2885E-05	.2599E-04
22.00	.3218E+07	.2104E+06	.8862E+06	2.2857	.1494	25600.1	1154.1	20290.5	1311.2	6115.8	-.3005E-05	.2450E-04
23.00	.3005E+07	.2195E+06	.9365E+06	2.2457	.1641	24146.8	1271.4	18947.7	1368.5	6520.7	-.3106E-05	.2303E-04
24.00	.2804E+07	.2293E+06	.9866E+06	2.1949	.1795	22769.6	1395.8	17671.7	1429.7	6945.6	-.3187E-05	.2160E-04
25.00	.2613E+07	.2398E+06	.1036E+07	2.1354	.1960	21466.4	1527.7	16466.6	1495.1	7388.1	-.3246E-05	.2020E-04
26.00	.2435E+07	.2510E+06	.1086E+07	2.0693	.2133	20234.3	1667.4	15334.4	1564.8	7845.9	-.3283E-05	.1884E-04
27.00	.2267E+07	.2629E+06	.1134E+07	1.9981	.2317	19073.5	1815.2	14275.3	1639.2	8316.1	-.3297E-05	.1752E-04
28.00	.2111E+07	.2756E+06	.1181E+07	1.9236	.2511	17971.9	1971.5	13287.9	1718.6	8795.0	-.3286E-05	.1624E-04
29.00	.1966E+07	.2891E+06	.1227E+07	1.8468	.2716	16935.3	2136.6	12370.0	1803.3	9278.3	-.3251E-05	.1501E-04
30.00	.1832E+07	.3036E+06	.1271E+07	1.7691	.2932	15957.4	2311.1	11518.6	1893.5	9761.1	-.3190E-05	.1382E-04
31.00	.1707E+07	.3191E+06	.1314E+07	1.6911	.3160	15035.2	2495.3	10730.1	1989.8	10238.1	-.3103E-05	.1268E-04
32.00	.1592E+07	.3354E+06	.1355E+07	1.6136	.3400	14165.4	2689.7	10000.7	2092.5	10703.6	-.2989E-05	.1158E-04
33.00	.1485E+07	.3529E+06	.1393E+07	1.5373	.3653	13345.1	2894.9	9326.6	2202.0	11151.9	-.2847E-05	.1053E-04
34.00	.1386E+07	.3716E+06	.1429E+07	1.4626	.3920	12571.4	3111.3	8703.8	2318.9	11577.7	-.2677E-05	.9518E-05
35.00	.1295E+07	.3915E+06	.1463E+07	1.3898	.4200	11841.6	3339.7	8128.5	2443.7	11975.8	-.2479E-05	.8554E-05
36.00	.1211E+07	.4128E+06	.1494E+07	1.3192	.4496	11152.9	3580.6	7597.1	2576.9	12342.1	-.2251E-05	.7634E-05
37.00	.1133E+07	.4355E+06	.1522E+07	1.2509	.4807	10503.0	3834.7	7106.1	2719.3	12673.0	-.1994E-05	.6758E-05
38.00	.1061E+07	.4598E+06	.1547E+07	1.1850	.5134	9889.5	4102.8	6652.3	2871.6	12966.1	-.1706E-05	.5924E-05
39.00	.9947E+06	.4858E+06	.1569E+07	1.1217	.5478	9310.1	4385.7	6232.6	3034.4	13219.9	-.1386E-05	.5133E-05
40.00	.9330E+06	.5136E+06	.1588E+07	1.0609	.5840	8762.9	4684.1	5844.2	3208.8	13433.7	-.1035E-05	.4383E-05
41.00	.8759E+06	.5434E+06	.1604E+07	1.0026	.6220	8245.7	4999.1	5484.6	3395.5	13607.3	-.6517E-06	.3673E-05
42.00	.8229E+06	.5753E+06	.1616E+07	.9469	.6620	7756.9	5331.5	5151.3	3595.8	13741.3	-.2350E-06	.3002E-05
43.00	.7737E+06	.6095E+06	.1625E+07	.8936	.7040	7294.7	5682.5	4842.2	3810.6	13836.4	.2155E-06	.2371E-05
44.00	.7281E+06	.6463E+06	.1631E+07	.8428	.7481	6857.6	6053.1	4555.2	4041.2	13893.1	.7007E-06	.1777E-05
45.00	.6857E+06	.6857E+06	.1632E+07	.7943	.7943	6444.0	6444.6	4288.7	4289.1	13911.9	.1221E-05	.1220E-05

THORNEL 300/E OXY -SPACEWIND-
FIBER COVERAGE RATIO = .500

FIBER PROPERTIES		RESIN PROPERTIES		COMPOSITE PROPERTIES
VF = .5000	EF = 3.400E+07	VR = .5000	ER = 4.700E+05	RHO= .0262
WF = .6069	EFT= 1.300E+06	WR = .3931	AR = 4.000E-05	FTU= 162500.0
RHOF= .0636	GF = 3.500E+06	RHOR= .0412	UR = .3500	FCU= 107500.0
FTU = 325000.0	AF =-2.400E-07	FSU = 8000.0		FSU= 8000.0
FCU = 215000.0	AFT= 2.960E-06			
UF = .2200				

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	8.617E+06	2.194E+05	2.548E+05	.2856	.0073	81250.0	.0	53750.0	1365.6	1971.6	3.087E-07	3.714E-05
1.00	8.611E+06	2.196E+05	2.571E+05	.2954	.0075	81041.2	2.9	53715.0	1366.8	2094.8	2.988E-07	3.709E-05
2.00	8.592E+06	2.201E+05	2.642E+05	.3264	.0084	80420.7	11.7	53608.4	1370.1	2227.0	2.693E-07	3.697E-05
3.00	8.560E+06	2.210E+05	2.758E+05	.3774	.0097	79405.8	26.4	53425.1	1375.8	2369.0	2.205E-07	3.676E-05
4.00	8.512E+06	2.223E+05	2.921E+05	.4475	.0117	78023.9	47.0	53156.8	1383.7	2521.6	1.529E-07	3.648E-05
5.00	8.449E+06	2.239E+05	3.129E+05	.5353	.0142	76310.8	73.5	52792.9	1394.0	2685.7	6.752E-08	3.611E-05
6.00	8.367E+06	2.259E+05	3.381E+05	.6390	.0173	74308.6	106.0	52320.9	1406.5	2862.2	-3.476E-08	3.567E-05
7.00	8.265E+06	2.283E+05	3.676E+05	.7563	.0209	72063.1	144.6	51727.5	1421.5	3052.3	-1.527E-07	3.515E-05
8.00	8.141E+06	2.311E+05	4.012E+05	.8846	.0251	69621.6	189.3	50999.7	1438.9	3256.9	-2.849E-07	3.457E-05
9.00	7.993E+06	2.343E+05	4.389E+05	1.0208	.0299	67031.0	240.3	50125.9	1458.8	3477.3	-4.298E-07	3.391E-05
10.00	7.821E+06	2.379E+05	4.803E+05	1.1614	.0353	64335.5	297.6	49097.5	1481.3	3714.6	-5.857E-07	3.320E-05
11.00	7.624E+06	2.419E+05	5.253E+05	1.3029	.0413	61576.2	361.4	47910.1	1506.4	3970.1	-7.508E-07	3.243E-05
12.00	7.403E+06	2.464E+05	5.737E+05	1.4414	.0480	58789.5	431.8	46564.2	1534.3	4245.1	-9.232E-07	3.160E-05
13.00	7.158E+06	2.513E+05	6.252E+05	1.5735	.0552	56007.0	508.9	45066.1	1564.9	4540.9	-1.101E-06	3.073E-05
14.00	6.891E+06	2.567E+05	6.796E+05	1.6958	.0632	53255.3	593.0	43428.1	1598.6	4858.8	-1.282E-06	2.981E-05
15.00	6.607E+06	2.626E+05	7.367E+05	1.8053	.0718	50556.2	684.1	41667.5	1635.2	5200.1	-1.464E-06	2.885E-05
16.00	6.307E+06	2.690E+05	7.961E+05	1.9000	.0810	47926.9	782.4	39806.7	1675.1	5565.8	-1.644E-06	2.786E-05
17.00	5.997E+06	2.759E+05	8.576E+05	1.9780	.0910	45380.8	888.3	37871.0	1718.3	5957.1	-1.822E-06	2.685E-05
18.00	5.680E+06	2.834E+05	9.208E+05	2.0385	.1017	42927.2	1001.9	35887.5	1765.0	6374.8	-1.995E-06	2.580E-05
19.00	5.361E+06	2.914E+05	9.855E+05	2.0813	.1131	40572.8	1123.5	33883.7	1815.4	6819.4	-2.160E-06	2.474E-05
20.00	5.044E+06	3.001E+05	1.051E+06	2.1068	.1253	38321.4	1253.3	31885.7	1869.7	7291.3	-2.316E-06	2.366E-05
21.00	4.733E+06	3.095E+05	1.118E+06	2.1159	.1384	36174.9	1391.6	29917.1	1928.1	7790.4	-2.461E-06	2.258E-05
22.00	4.429E+06	3.195E+05	1.185E+06	2.1099	.1522	34133.4	1538.8	27998.5	1990.8	8315.8	-2.593E-06	2.148E-05
23.00	4.137E+06	3.303E+05	1.252E+06	2.0904	.1669	32195.7	1695.2	26146.5	2058.1	8866.4	-2.709E-06	2.039E-05
24.00	3.857E+06	3.418E+05	1.319E+06	2.0590	.1825	30359.5	1861.1	24374.2	2130.3	9440.2	-2.809E-06	1.930E-05
25.00	3.592E+06	3.542E+05	1.386E+06	2.0177	.1989	28621.8	2037.0	22690.7	2207.7	10034.6	-2.890E-06	1.821E-05
26.00	3.342E+06	3.674E+05	1.452E+06	1.9682	.2164	26979.1	2223.2	21101.9	2290.6	10646.1	-2.952E-06	1.713E-05
27.00	3.107E+06	3.816E+05	1.516E+06	1.9120	.2349	25427.4	2420.3	19610.8	2379.5	11270.5	-2.991E-06	1.606E-05
28.00	2.888E+06	3.968E+05	1.580E+06	1.8507	.2543	23962.5	2628.7	18217.9	2474.6	11902.7	-3.008E-06	1.501E-05
29.00	2.683E+06	4.131E+05	1.641E+06	1.7857	.2749	22580.4	2848.9	16921.7	2576.5	12537.2	-3.001E-06	1.398E-05
30.00	2.494E+06	4.306E+05	1.701E+06	1.7181	.2966	21276.6	3081.5	15719.4	2685.7	13167.6	-2.968E-06	1.296E-05
31.00	2.319E+06	4.492E+05	1.758E+06	1.6490	.3195	20046.9	3327.1	14607.0	2802.7	13787.4	-2.908E-06	1.197E-05
32.00	2.157E+06	4.692E+05	1.812E+06	1.5792	.3436	18887.2	3586.3	13579.8	2928.0	14389.9	-2.820E-06	1.100E-05
33.00	2.007E+06	4.907E+05	1.864E+06	1.5094	.3690	17793.5	3859.8	12632.7	3062.4	14968.5	-2.704E-06	1.006E-05
34.00	1.870E+06	5.137E+05	1.912E+06	1.4402	.3957	16761.9	4148.5	11760.6	3206.6	15516.8	-2.557E-06	9.148E-06
35.00	1.743E+06	5.384E+05	1.957E+06	1.3720	.4238	15788.8	4452.9	10957.9	3361.3	16029.3	-2.380E-06	8.262E-06
36.00	1.626E+06	5.648E+05	1.998E+06	1.3054	.4534	14870.6	4774.2	10219.6	3527.4	16501.1	-2.172E-06	7.408E-06
37.00	1.519E+06	5.933E+05	2.036E+06	1.2404	.4845	14004.0	5113.0	9540.6	3705.9	16928.3	-1.932E-06	6.584E-06
38.00	1.420E+06	6.239E+05	2.070E+06	1.1773	.5172	13186.0	5470.5	8916.0	3897.8	17308.0	-1.658E-06	5.793E-06
39.00	1.329E+06	6.567E+05	2.099E+06	1.1162	.5515	12413.5	5847.6	8341.4	4104.3	17638.1	-1.352E-06	5.035E-06
40.00	1.246E+06	6.921E+05	2.124E+06	1.0574	.5876	11683.8	6245.5	7812.7	4326.6	17917.5	-1.011E-06	4.311E-06
41.00	1.168E+06	7.303E+05	2.145E+06	1.0007	.6254	10994.3	6665.4	7325.8	4566.1	18145.7	-6.367E-07	3.621E-06
42.00	1.097E+06	7.713E+05	2.161E+06	.9462	.6652	10342.6	7108.7	6877.2	4824.4	18322.7	-2.275E-07	2.965E-06
43.00	1.032E+06	8.157E+05	2.173E+06	.8940	.7068	9726.3	7576.7	6463.6	5103.3	18448.7	2.167E-07	2.345E-06
44.00	9.711E+05	8.635E+05	2.180E+06	.8440	.7505	9143.5	8070.8	6082.3	5404.5	18524.1	6.960E-07	1.760E-06
45.00	9.152E+05	9.153E+05	2.182E+06	.7961	.7962	8592.0	8592.8	5729.6	5730.2	18549.2	1.211E-06	1.210E-06

THORNEL 300/EPOXY -SPACEWIND-
FIBER COVERAGE RATIO = .625

FIBER PROPERTIES

VF = .5000
WF = .6969
RHOF= .0636
FTU = 325000.0
FCU = 215000.0
UF = .2200
EF = .341E+08
EFT= .130E+07
GF = .350E+07
AF = -.240E-06
AFT= .296E-05

RESIN PROPERTIES

VR = .5000
WR = .3931
RHOR= .0412
FSU = 8000.0
ER = .470E+06
AR = .400E-04
UR = .3500

COMPOSITE PROPERTIES

RHO= .0328
FTU= 162500.0
FCU= 107500.0
FSU= 8000.0

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	.1077E+08	.3428E+06	.3185E+06	.2850	.0091	101562.5	-.0	67187.5	2132.8	2467.6	.3087E-06	.2971E-04
1.00	.1076E+08	.3430E+06	.3214E+06	.2934	.0093	101301.5	3.7	67143.9	2133.9	2620.7	.3008E-06	.2968E-04
2.00	.1074E+08	.3435E+06	.3302E+06	.3183	.0102	100525.9	14.6	67011.2	2137.4	2785.7	.2772E-06	.2961E-04
3.00	.1070E+08	.3445E+06	.3449E+06	.3596	.0116	99257.2	33.0	66784.5	2143.2	2963.6	.2381E-06	.2948E-04
4.00	.1064E+08	.3458E+06	.3653E+06	.4164	.0135	97529.8	58.7	66455.4	2151.3	3155.4	.1838E-06	.2931E-04
5.00	.1056E+08	.3474E+06	.3914E+06	.4880	.0160	95388.5	91.8	66013.1	2161.8	3362.5	.1148E-06	.2909E-04
6.00	.1046E+08	.3495E+06	.4230E+06	.5730	.0191	92885.7	132.5	65444.6	2174.7	3586.0	.3175E-07	.2882E-04
7.00	.1034E+08	.3520E+06	.4600E+06	.6700	.0228	90078.9	180.8	64735.9	2190.1	3827.4	-.6467E-07	.2850E-04
8.00	.1019E+08	.3548E+06	.5022E+06	.7772	.0271	87027.1	236.7	63872.7	2208.1	4086.1	-.1736E-06	.2814E-04
9.00	.1002E+08	.3581E+06	.5494E+06	.8922	.0319	83788.7	300.4	62841.9	2228.7	4369.5	-.2940E-06	.2773E-04
10.00	.9816E+07	.3619E+06	.6014E+06	1.0127	.0373	80419.4	372.1	61632.6	2251.9	4673.3	-.4248E-06	.2728E-04
11.00	.9583E+07	.3660E+06	.6578E+06	1.1360	.0434	76970.3	451.8	60237.8	2277.9	5001.0	-.5648E-06	.2679E-04
12.00	.9321E+07	.3706E+06	.7186E+06	1.2590	.0501	73486.9	539.8	58655.3	2306.9	5354.2	-.7127E-06	.2625E-04
13.00	.9030E+07	.3758E+06	.7832E+06	1.3790	.0574	70008.7	636.2	56888.5	2338.9	5734.4	-.8670E-06	.2568E-04
14.00	.8713E+07	.3814E+06	.8515E+06	1.4931	.0654	66569.1	741.2	54947.3	2374.0	6143.3	-.1026E-05	.2507E-04
15.00	.8372E+07	.3875E+06	.9231E+06	1.5985	.0740	63195.2	855.1	52847.9	2412.4	6582.2	-.1189E-05	.2443E-04
16.00	.8011E+07	.3942E+06	.9976E+06	1.6931	.0833	59908.7	978.1	50612.2	2454.4	7052.3	-.1353E-05	.2375E-04
17.00	.7634E+07	.4015E+06	.1075E+07	1.7749	.0934	56725.9	1110.4	48267.0	2500.0	7554.7	-.1517E-05	.2304E-04
18.00	.7246E+07	.4094E+06	.1154E+07	1.8427	.1041	53659.0	1252.4	45842.5	2549.4	8090.1	-.1679E-05	.2231E-04
19.00	.6852E+07	.4180E+06	.1235E+07	1.8955	.1156	50715.9	1404.3	43370.6	2603.0	8659.0	-.1837E-05	.2155E-04
20.00	.6456E+07	.4272E+06	.1318E+07	1.9331	.1279	47901.7	1566.6	40883.2	2661.0	9261.0	-.1990E-05	.2076E-04
21.00	.6065E+07	.4372E+06	.1401E+07	1.9558	.1410	45218.6	1739.5	38410.9	2723.6	9895.7	-.2135E-05	.1996E-04
22.00	.5681E+07	.4480E+06	.1485E+07	1.9643	.1549	42666.8	1923.5	35981.3	2791.1	10561.5	-.2270E-05	.1913E-04
23.00	.5308E+07	.4596E+06	.1570E+07	1.9595	.1697	40244.6	2119.0	33618.4	2863.9	11256.6	-.2394E-05	.1829E-04
24.00	.4949E+07	.4722E+06	.1654E+07	1.9428	.1854	37949.4	2326.4	31341.8	2942.4	11978.0	-.2504E-05	.1744E-04
25.00	.4607E+07	.4857E+06	.1738E+07	1.9155	.2019	35777.3	2546.2	29166.8	3026.9	12722.0	-.2598E-05	.1658E-04
26.00	.4283E+07	.5002E+06	.1820E+07	1.8792	.2195	33723.8	2779.0	27104.2	3117.9	13484.1	-.2675E-05	.1570E-04
27.00	.3977E+07	.5158E+06	.1901E+07	1.8352	.2380	31784.2	3025.4	25161.9	3216.0	14258.8	-.2733E-05	.1483E-04
28.00	.3691E+07	.5327E+06	.1981E+07	1.7850	.2576	29953.2	3285.8	23340.4	3321.5	15040.1	-.2769E-05	.1395E-04
29.00	.3424E+07	.5508E+06	.2058E+07	1.7300	.2783	28225.5	3561.1	21643.2	3435.2	15821.1	-.2783E-05	.1308E-04
30.00	.3177E+07	.5703E+06	.2132E+07	1.6713	.3000	26595.7	3851.8	20067.3	3557.7	16594.6	-.2771E-05	.1220E-04
31.00	.2948E+07	.5913E+06	.2204E+07	1.6099	.3230	25058.6	4158.8	18609.0	3689.7	17352.9	-.2733E-05	.1134E-04
32.00	.2736E+07	.6140E+06	.2272E+07	1.5469	.3472	23609.0	4482.8	17263.4	3831.9	18088.4	-.2667E-05	.1048E-04
33.00	.2541E+07	.6385E+06	.2337E+07	1.4830	.3726	22241.8	4824.8	16024.6	3985.4	18793.7	-.2572E-05	.9636E-05
34.00	.2362E+07	.6648E+06	.2398E+07	1.4189	.3994	20952.4	5185.6	14886.1	4151.0	19461.9	-.2446E-05	.8804E-05
35.00	.2197E+07	.6933E+06	.2454E+07	1.3551	.4275	19736.0	5566.2	13841.2	4329.8	20086.7	-.2288E-05	.7989E-05
36.00	.2047E+07	.7240E+06	.2506E+07	1.2921	.4571	18588.2	5967.7	12883.1	4523.0	20662.5	-.2097E-05	.7194E-05
37.00	.1908E+07	.7572E+06	.2553E+07	1.2303	.4882	17505.1	6391.2	12005.3	4731.9	21185.0	-.1872E-05	.6419E-05
38.00	.1781E+07	.7932E+06	.2595E+07	1.1698	.5209	16482.5	6838.1	11201.3	4958.0	21650.6	-.1613E-05	.5667E-05
39.00	.1665E+07	.8321E+06	.2632E+07	1.1110	.5551	15516.9	7309.5	10465.1	5202.7	22056.6	-.1319E-05	.4940E-05
40.00	.1559E+07	.8742E+06	.2664E+07	1.0539	.5911	14604.8	7806.9	9790.9	5468.0	22401.5	-.9883E-06	.4241E-05
41.00	.1461E+07	.9199E+06	.2690E+07	.9987	.6288	13742.9	8331.8	9173.3	5755.6	22684.1	-.6222E-06	.3570E-05
42.00	.1372E+07	.9694E+06	.2710E+07	.9455	.6683	12928.2	8885.9	8607.5	6067.9	22904.0	-.2201E-06	.2929E-05
43.00	.1290E+07	.1023E+07	.2725E+07	.8943	.7096	12157.9	9470.8	8088.7	6407.0	23061.0	.2179E-06	.2319E-05
44.00	.1214E+07	.1082E+07	.2734E+07	.8452	.7528	11429.3	10088.6	7612.9	6775.7	23155.1	.6914E-06	.1742E-05
45.00	.1145E+07	.1145E+07	.2737E+07	.7980	.7980	10740.0	10741.0	7176.2	7176.9	23186.5	.1200E-05	.1199E-05

THORNEL 300/E OXY -SPACEWIND-
FIBER COVERAGE RATIO = .750

FIBER PROPERTIES		RESIN PROPERTIES		COMPOSITE PROPERTIES
VF = .5000	EF = 3.400E+07	VR = .5000	ER = 4.700E+05	RHO= .0393
WF = .6369	EFT= 1.300E+06	WR = .3931	AR = 4.000E-05	FTU= 162500.0
RHOF= .0636	GF = 3.500E+06	RHOR= .0412	UR = .3500	FCU= 107500.0
FTU = 325000.0	AF =-2.400E-07	FSU = 8000.0		FSU= 8000.0
FCU = 215000.0	AFT= 2.960E-06			
UF = .2200				

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	1.293E+07	4.936E+05	3.822E+05	.2850	.0109	121875.0	.0	80625.0	3069.7	2964.7	3.087E-07	2.476E-05
1.00	1.292E+07	4.938E+05	3.857E+05	.2920	.0112	121561.8	4.4	80572.7	3070.8	3147.6	3.021E-07	2.474E-05
2.00	1.289E+07	4.943E+05	3.963E+05	.3130	.0120	120631.1	17.6	80414.1	3074.0	3345.3	2.825E-07	2.469E-05
3.00	1.284E+07	4.952E+05	4.140E+05	.3476	.0134	119108.7	39.6	80144.1	3079.4	3559.2	2.499E-07	2.461E-05
4.00	1.277E+07	4.964E+05	4.386E+05	.3955	.0154	117035.8	70.4	79754.4	3087.0	3790.7	2.045E-07	2.450E-05
5.00	1.268E+07	4.980E+05	4.700E+05	.4560	.0179	114466.2	110.2	79233.9	3096.9	4041.4	1.467E-07	2.435E-05
6.00	1.256E+07	4.999E+05	5.081E+05	.5282	.0210	111462.9	159.0	78569.5	3109.1	4312.9	7.683E-08	2.418E-05
7.00	1.242E+07	5.022E+05	5.526E+05	.6111	.0247	108094.6	216.9	77746.4	3123.6	4607.0	-4.635E-09	2.397E-05
8.00	1.225E+07	5.049E+05	6.035E+05	.7031	.0290	104432.5	284.0	76749.8	3140.5	4925.3	-9.714E-08	2.373E-05
9.00	1.205E+07	5.080E+05	6.607E+05	.8028	.0339	100546.5	360.5	75565.1	3160.0	5269.8	-2.000E-07	2.346E-05
10.00	1.181E+07	5.115E+05	7.229E+05	.9083	.0393	96503.3	446.5	74180.1	3182.1	5642.2	-3.126E-07	2.315E-05
11.00	1.154E+07	5.155E+05	7.909E+05	1.0174	.0454	92364.3	542.2	72585.5	3206.9	6044.6	-4.339E-07	2.282E-05
12.00	1.124E+07	5.199E+05	8.647E+05	1.1278	.0522	88184.3	647.7	70776.7	3234.6	6478.7	-5.631E-07	2.245E-05
13.00	1.091E+07	5.248E+05	9.419E+05	1.2371	.0595	84010.5	763.4	68755.0	3265.3	6946.2	-6.991E-07	2.206E-05
14.00	1.054E+07	5.302E+05	1.024E+06	1.3430	.0675	79882.9	889.4	66527.7	3299.2	7449.0	-8.408E-07	2.163E-05
15.00	1.015E+07	5.361E+05	1.110E+06	1.4430	.0762	75834.3	1026.1	64109.4	3336.4	7988.3	-9.871E-07	2.118E-05
16.00	9.729E+06	5.426E+05	1.200E+06	1.5351	.0856	71890.4	1173.7	61521.0	3377.3	8565.6	-1.136E-06	2.070E-05
17.00	9.288E+06	5.497E+05	1.293E+06	1.6173	.0957	68071.1	1332.5	58789.6	3421.9	9181.6	-1.287E-06	2.019E-05
18.00	8.832E+06	5.575E+05	1.388E+06	1.6886	.1065	64390.8	1502.9	55946.9	3470.5	9835.9	-1.439E-06	1.965E-05
19.00	8.366E+06	5.659E+05	1.486E+06	1.7463	.1181	60859.1	1685.2	53028.1	3523.5	10531.4	-1.588E-06	1.908E-05
20.00	7.895E+06	5.751E+05	1.586E+06	1.7914	.1305	57482.1	1879.9	50069.6	3581.2	11264.6	-1.735E-06	1.849E-05
21.00	7.426E+06	5.851E+05	1.686E+06	1.8232	.1437	54262.4	2087.4	47107.5	3643.8	12035.2	-1.877E-06	1.788E-05
22.00	6.962E+06	5.959E+05	1.788E+06	1.8418	.1576	51204.1	2308.2	44176.0	3711.8	12841.2	-2.011E-06	1.724E-05
23.00	6.509E+06	6.077E+05	1.889E+06	1.8479	.1725	48293.6	2542.8	41315.8	3785.6	13679.7	-2.137E-06	1.658E-05
24.00	6.071E+06	6.204E+05	1.991E+06	1.8422	.1882	45539.3	2791.6	38523.4	3865.6	14546.9	-2.252E-06	1.591E-05
25.00	5.651E+06	6.342E+05	2.091E+06	1.8259	.2049	42932.7	3055.5	35850.5	3952.3	15438.2	-2.354E-06	1.521E-05
26.00	5.251E+06	6.492E+05	2.191E+06	1.8002	.2226	40468.6	3334.8	33303.7	4046.4	16348.0	-2.441E-06	1.450E-05
27.00	4.873E+06	6.654E+05	2.289E+06	1.7663	.2412	38141.0	3630.4	30894.5	4148.4	17270.0	-2.511E-06	1.377E-05
28.00	4.518E+06	6.831E+05	2.384E+06	1.7255	.2608	35943.8	3943.0	28630.4	4259.0	18196.9	-2.562E-06	1.303E-05
29.00	4.186E+06	7.021E+05	2.477E+06	1.6790	.2816	33870.6	4273.3	26514.4	4378.9	19121.1	-2.591E-06	1.228E-05
30.00	3.878E+06	7.228E+05	2.567E+06	1.6280	.3035	31914.8	4622.2	24546.6	4509.1	20034.3	-2.596E-06	1.153E-05
31.00	3.592E+06	7.452E+05	2.653E+06	1.5736	.3265	30070.3	4990.6	22724.3	4650.4	20928.1	-2.576E-06	1.077E-05
32.00	3.328E+06	7.696E+05	2.735E+06	1.5168	.3507	28330.8	5379.4	21042.7	4803.8	21794.1	-2.528E-06	1.001E-05
33.00	3.086E+06	7.961E+05	2.813E+06	1.4582	.3762	26690.2	5789.7	19495.6	4970.5	22624.1	-2.451E-06	9.244E-06
34.00	2.863E+06	8.249E+05	2.886E+06	1.3988	.4031	25142.8	6222.7	18075.6	5151.7	23410.5	-2.343E-06	8.485E-06
35.00	2.659E+06	8.562E+05	2.954E+06	1.3390	.4312	23683.2	6679.4	16775.0	5348.9	24146.3	-2.202E-06	7.734E-06
36.00	2.472E+06	8.902E+05	3.017E+06	1.2795	.4608	22305.9	7161.2	15585.5	5563.4	24825.3	-2.027E-06	6.991E-06
37.00	2.301E+06	9.273E+05	3.074E+06	1.2205	.4919	21006.1	7669.5	14499.0	5797.1	25442.5	-1.816E-06	6.261E-06
38.00	2.145E+06	9.677E+05	3.124E+06	1.1626	.5245	19779.0	8205.7	13507.5	6051.8	25993.6	-1.570E-06	5.546E-06
39.00	2.003E+06	1.012E+06	3.169E+06	1.1058	.5587	18620.3	8771.4	12603.2	6329.6	26475.4	-1.287E-06	4.849E-06
40.00	1.873E+06	1.061E+06	3.207E+06	1.0506	.5946	17525.7	9368.3	11778.7	6632.8	26885.6	-9.660E-07	4.173E-06
41.00	1.754E+06	1.112E+06	3.238E+06	.9969	.6321	16491.5	9998.2	11027.2	6963.9	27222.6	-6.081E-07	3.521E-06
42.00	1.646E+06	1.171E+06	3.263E+06	.9449	.6713	15513.9	10663.0	10342.1	7325.8	27485.4	-2.129E-07	2.893E-06
43.00	1.548E+06	1.232E+06	3.281E+06	.8947	.7123	14589.5	11365.0	9717.6	7721.7	27673.3	2.190E-07	2.294E-06
44.00	1.458E+06	1.301E+06	3.291E+06	.8463	.7552	13715.2	12106.3	9148.0	8154.8	27785.2	6.870E-07	1.726E-06
45.00	1.376E+06	1.376E+06	3.295E+06	.7998	.7999	12887.9	12889.3	8628.4	8629.2	27823.8	1.190E-06	1.189E-06

THORNEL 300/EPOXY -SPACEWIND-
FIBER COVERAGE RATIO = .875

FIBER PROPERTIES		RESIN PROPERTIES		COMPOSITE PROPERTIES
VF = .5100	EF = .340E+08	VR = .5000	ER = .470E+06	RHO= .0459
WF = .6069	EFT= .13JE+07	WR = .3931	AR = .400E-04	FTU= 162500.0
RHOF= .0636	GF = .350E+07	KHOR= .0412	UR = .3500	FCU= 107500.0
FTU = 325000.0	AF = -.240E-06	FSU = 8000.0		FSU= 8000.0
FCU = 215000.0	AFT= .296E-05			
UF = .2200				

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	.1508E+08	.6719E+06	.4459E+06	.2850	.0127	142187.5	-.0	94062.5	4176.2	3463.1	.3087E-06	.2122E-04
1.00	.1507E+08	.6720E+06	.4500E+06	.2911	.0130	141822.1	5.1	94001.6	4177.1	3675.4	.3031E-06	.2121E-04
2.00	.1504E+08	.6724E+06	.4624E+06	.3091	.0138	140736.3	20.5	93817.1	4179.8	3905.7	.2862E-06	.2118E-04
3.00	.1498E+08	.6732E+06	.4831E+06	.3391	.0152	138960.1	46.2	93503.8	4184.3	4155.7	.2583E-06	.2112E-04
4.00	.1490E+08	.6742E+06	.5119E+06	.3805	.0172	136541.8	82.2	93053.6	4190.7	4427.3	.2194E-06	.2104E-04
5.00	.1479E+08	.6755E+06	.5487E+06	.4330	.0198	133543.9	128.6	92455.1	4199.0	4722.3	.1697E-06	.2095E-04
6.00	.1466E+08	.6771E+06	.5933E+06	.4959	.0229	130040.0	185.5	91695.1	4209.3	5042.8	.1094E-06	.2082E-04
7.00	.1450E+08	.6791E+06	.6455E+06	.5682	.0266	126110.4	253.1	90758.5	4221.6	5390.7	.3892E-07	.2068E-04
8.00	.1431E+08	.6813E+06	.7050E+06	.6491	.0309	121837.9	331.4	89629.7	4236.0	5768.2	-.4142E-07	.2051E-04
9.00	.1407E+08	.6840E+06	.7715E+06	.7371	.0358	117304.2	420.6	88293.3	4252.7	6177.5	-.1312E-06	.2032E-04
10.00	.1381E+08	.6870E+06	.8448E+06	.8309	.0413	112587.2	520.9	86735.6	4271.7	6620.7	-.2298E-06	.2011E-04
11.00	.1351E+08	.6904E+06	.9245E+06	.9288	.0475	107758.4	632.5	84946.1	4293.1	7099.9	-.3367E-06	.1987E-04
12.00	.1317E+08	.6942E+06	.1010E+07	1.0288	.0542	102881.6	755.7	82918.0	4317.2	7617.2	-.4513E-06	.1961E-04
13.00	.1279E+08	.6984E+06	.1101E+07	1.1290	.0616	98012.2	890.6	80650.5	4344.1	8174.5	-.5727E-06	.1933E-04
14.00	.1238E+08	.7032E+06	.1198E+07	1.2274	.0697	93196.7	1037.7	78149.0	4373.9	8773.4	-.7002E-06	.1902E-04
15.00	.1193E+08	.7084E+06	.1298E+07	1.3219	.0785	88473.3	1197.1	75426.1	4407.0	9415.6	-.8326E-06	.1869E-04
16.00	.1146E+08	.7142E+06	.1404E+07	1.4104	.0879	83872.2	1369.3	72501.4	4443.5	10101.9	-.9691E-06	.1834E-04
17.00	.1096E+08	.7206E+06	.1512E+07	1.4912	.0981	79416.3	1554.5	69401.7	4483.8	10833.3	-.1108E-05	.1796E-04
18.00	.1043E+08	.7276E+06	.1624E+07	1.5628	.1090	75122.6	1753.3	66159.5	4528.0	11609.7	-.1249E-05	.1755E-04
19.00	.9899E+07	.7353E+06	.1739E+07	1.6239	.1206	71002.3	1966.1	62811.9	4576.6	12430.9	-.1390E-05	.1712E-04
20.00	.9355E+07	.7437E+06	.1855E+07	1.6736	.1331	67062.4	2193.2	59398.7	4630.0	13295.6	-.1530E-05	.1667E-04
21.00	.8809E+07	.7530E+06	.1973E+07	1.7114	.1463	63306.1	2435.3	55960.7	4688.5	14201.9	-.1667E-05	.1619E-04
22.00	.8267E+07	.7632E+06	.2092E+07	1.7373	.1604	59733.5	2692.9	52537.6	4752.5	15147.2	-.1799E-05	.1569E-04
23.00	.7735E+07	.7743E+06	.2211E+07	1.7514	.1753	56342.5	2966.5	49166.5	4822.7	16127.7	-.1924E-05	.1517E-04
24.00	.7218E+07	.7865E+06	.2329E+07	1.7543	.1911	53129.1	3256.9	45880.5	4899.5	17139.0	-.2041E-05	.1462E-04
25.00	.6726E+07	.7998E+06	.2447E+07	1.7467	.2079	50088.2	3564.7	42707.7	4983.6	18175.4	-.2147E-05	.1405E-04
26.00	.6263E+07	.8144E+06	.2564E+07	1.7296	.2256	47213.4	3890.6	39670.6	5075.6	19230.5	-.2241E-05	.1346E-04
27.00	.5791E+07	.8303E+06	.2678E+07	1.7041	.2443	44497.9	4235.5	36786.4	5176.3	20297.1	-.2319E-05	.1285E-04
28.00	.5365E+07	.8478E+06	.2790E+07	1.6712	.2641	41934.5	4600.2	34066.8	5286.6	21367.1	-.2379E-05	.1222E-04
29.00	.4966E+07	.8669E+06	.2899E+07	1.6322	.2849	39515.6	4985.5	31518.5	5407.3	22432.0	-.2420E-05	.1158E-04
30.00	.4595E+07	.8879E+06	.3004E+07	1.5880	.3069	37234.0	5392.6	29144.1	5539.6	23482.6	-.2439E-05	.1092E-04
31.00	.4251E+07	.9108E+06	.3105E+07	1.5398	.3300	35082.0	5822.3	26942.5	5684.5	24509.9	-.2433E-05	.1025E-04
32.00	.3932E+07	.9360E+06	.3201E+07	1.4884	.3543	33052.6	6276.0	24909.9	5843.3	25504.6	-.2401E-05	.9570E-05
33.00	.3640E+07	.9636E+06	.3292E+07	1.4348	.3798	31138.6	6754.7	23039.9	6017.4	26457.9	-.2339E-05	.8882E-05
34.00	.3371E+07	.9938E+06	.3378E+07	1.3796	.4067	29333.3	7259.8	21325.1	6208.4	27361.3	-.2246E-05	.8188E-05
35.00	.3126E+07	.1027E+07	.3457E+07	1.3236	.4349	27630.3	7792.7	19756.5	6418.0	28207.3	-.2120E-05	.7493E-05
36.00	.2901E+07	.1063E+07	.3531E+07	1.2673	.4645	26023.5	8354.8	18324.9	6648.2	28989.0	-.1960E-05	.6800E-05
37.00	.2697E+07	.1103E+07	.3597E+07	1.2112	.4956	24507.1	8947.7	17020.5	6901.1	29700.4	-.1763E-05	.6111E-05
38.00	.2513E+07	.1147E+07	.3657E+07	1.1556	.5282	23075.5	9573.3	15833.8	7179.0	30336.9	-.1528E-05	.5430E-05
39.00	.2341E+07	.1196E+07	.3709E+07	1.1009	.5623	21723.7	10233.3	14755.3	7484.5	30894.3	-.1256E-05	.4761E-05
40.00	.2187E+07	.1249E+07	.3754E+07	1.0473	.5980	20446.7	10929.6	13776.0	7820.7	31369.8	-.9443E-06	.4107E-05
41.00	.2047E+07	.1307E+07	.3791E+07	.9950	.6353	19240.1	11664.5	12887.3	8190.8	31761.2	-.5943E-06	.3472E-05
42.00	.1921E+07	.1372E+07	.3819E+07	.9442	.6743	18099.5	12440.2	12081.2	8598.3	32066.8	-.2059E-06	.2858E-05
43.00	.1806E+07	.1443E+07	.3840E+07	.8950	.7151	17021.1	13259.2	11350.2	9047.1	32285.7	.2201E-06	.2270E-05
44.00	.1701E+07	.1521E+07	.3852E+07	.8474	.7575	16001.0	14124.0	10687.3	9541.8	32417.2	.6825E-06	.1709E-05
45.00	.1606E+07	.1607E+07	.3856E+07	.8016	.8016	15035.9	15037.5	10086.2	10087.1	32461.0	.1180E-05	.1179E-05

THORNEL 300/E OXY -SPACEWIND-
FIBER COVERAGE RATIO =1.000

FIBER PROPERTIES

VF = .5000
WF = .6069
RHOF= .0636
FTU = 325000.0
FCU = 215000.0
UF = .2200

EF = 3.400E+07
EFT= 1.300E+06
GF = 3.500E+06
AF =-2.400E-07
AFT= 2.960E-06

RESIN PROPERTIES

VR = .5000
WR = .3931
RHOR= .0412
FSU = 8000.0

ER = 4.700E+05
AR = 4.000E-05
UR = .3500

COMPOSITE PROPERTIES

RHO= .0524
FTU= 162500.0
FCU= 107500.0
FSU= 8000.0

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	1.723E+07	8.775E+05	5.495E+05	.2850	.0145	162500.0	.0	107500.0	5452.1	3962.7	3.087E-07	1.857E-05
1.00	1.722E+07	8.776E+05	5.143E+05	.2903	.0148	162082.4	5.9	107430.4	5452.7	4204.1	3.038E-07	1.856E-05
2.00	1.718E+07	8.779E+05	5.280E+05	.3063	.0156	160841.4	23.4	107220.0	5454.6	4466.9	2.891E-07	1.854E-05
3.00	1.712E+07	8.784E+05	5.523E+05	.3327	.0171	158811.6	52.8	106863.7	5457.7	4753.2	2.647E-07	1.850E-05
4.00	1.703E+07	8.791E+05	5.853E+05	.3692	.0191	156047.7	93.9	106353.0	5462.2	5065.3	2.306E-07	1.844E-05
5.00	1.691E+07	8.801E+05	6.275E+05	.4156	.0216	152621.6	147.0	105676.8	5468.0	5405.2	1.870E-07	1.837E-05
6.00	1.676E+07	8.811E+05	6.780E+05	.4714	.0248	148617.2	212.0	104821.5	5475.2	5775.5	1.341E-07	1.829E-05
7.00	1.658E+07	8.825E+05	7.385E+05	.5357	.0285	144126.2	289.2	103771.8	5484.0	6178.5	7.197E-08	1.818E-05
8.00	1.636E+07	8.842E+05	8.068E+05	.6078	.0329	139243.3	378.7	102511.6	5494.3	6616.7	1.008E-09	1.806E-05
9.00	1.611E+07	8.86 E+05	8.831E+05	.6866	.0378	134061.9	480.6	101024.9	5506.4	7092.4	-7.853E-08	1.793E-05
10.00	1.581E+07	8.882E+05	9.671E+05	.7713	.0433	128671.1	595.3	99297.0	5520.3	7608.1	-1.663E-07	1.777E-05
11.00	1.547E+07	8.906E+05	1.058E+06	.8601	.0495	123152.4	722.9	97315.8	5536.3	8166.1	-2.618E-07	1.760E-05
12.00	1.509E+07	8.935E+05	1.157E+06	.9515	.0563	117579.0	863.6	95073.3	5554.4	8768.6	-3.646E-07	1.741E-05
13.00	1.468E+07	8.967E+05	1.261E+06	1.0446	.0638	112014.0	1017.9	92566.7	5574.8	9417.6	-4.741E-07	1.720E-05
14.00	1.422E+07	9.003E+05	1.372E+06	1.1387	.0719	106510.6	1185.9	89799.5	5597.9	10114.7	-5.897E-07	1.698E-05
15.00	1.372E+07	9.043E+05	1.488E+06	1.2348	.0807	101112.4	1368.1	86782.5	5623.8	10861.3	-7.107E-07	1.673E-05
16.00	1.319E+07	9.089E+05	1.608E+06	1.3035	.0902	95863.9	1564.9	83534.1	5652.9	11658.3	-8.361E-07	1.646E-05
17.00	1.263E+07	9.141E+05	1.733E+06	1.3882	.1004	90761.5	1776.6	80080.1	5685.4	12506.1	-9.650E-07	1.617E-05
18.00	1.205E+07	9.196E+05	1.861E+06	1.4594	.1114	85894.4	2003.8	76453.3	5721.6	13404.6	-1.096E-06	1.586E-05
19.00	1.144E+07	9.26 E+05	1.992E+06	1.5217	.1231	81145.5	2246.9	72692.1	5762.1	14352.7	-1.229E-06	1.553E-05
20.00	1.083E+07	9.331E+05	2.126E+06	1.5741	.1356	76642.8	2506.5	68838.7	5807.1	15349.8	-1.362E-06	1.517E-05
21.00	1.021E+07	9.409E+05	2.261E+06	1.6164	.1489	72349.8	2783.2	64937.6	5857.3	16390.4	-1.493E-06	1.480E-05
22.00	9.591E+06	9.497E+05	2.397E+06	1.6471	.1631	68266.8	3077.6	61033.5	5913.0	17474.0	-1.621E-06	1.440E-05
23.00	8.981E+06	9.594E+05	2.534E+06	1.6673	.1781	64392.4	3389.3	57189.1	5975.0	18595.3	-1.745E-06	1.397E-05
24.00	8.385E+06	9.700E+05	2.671E+06	1.6768	.194	60719.0	3722.2	53383.5	6043.9	19748.9	-1.861E-06	1.353E-05
25.00	7.808E+06	9.823E+05	2.805E+06	1.6762	.2109	57243.6	4073.9	49711.2	6120.4	20928.5	-1.969E-06	1.306E-05
26.00	7.255E+06	9.957E+05	2.939E+06	1.6652	.2287	53958.1	4446.4	46181.1	6205.2	22126.9	-2.066E-06	1.256E-05
27.00	6.728E+06	1.011E+06	3.070E+06	1.6477	.2475	50854.7	4840.6	42815.9	6299.5	23336.0	-2.151E-06	1.205E-05
28.00	6.230E+06	1.027E+06	3.198E+06	1.6217	.2673	47925.1	5257.3	39632.3	6404.0	24547.0	-2.218E-06	1.151E-05
29.00	5.763E+06	1.045E+06	3.323E+06	1.5890	.2882	45160.7	5697.7	36641.1	6520.0	25750.6	-2.269E-06	1.095E-05
30.00	5.327E+06	1.066E+06	3.443E+06	1.5509	.3102	42553.1	6162.9	33848.2	6648.7	26937.0	-2.298E-06	1.038E-05
31.00	4.922E+06	1.088E+06	3.559E+06	1.5081	.3334	40093.7	6654.1	31254.6	6791.5	28096.2	-2.304E-06	9.782E-06
32.00	4.547E+06	1.113E+06	3.672E+06	1.4618	.3578	37774.4	7172.6	28857.9	6949.9	29218.4	-2.284E-06	9.171E-06
33.00	4.203E+06	1.141E+06	3.780E+06	1.4126	.3834	35586.9	7719.7	26652.5	7125.7	30293.9	-2.236E-06	8.547E-06
34.00	3.887E+06	1.172E+06	3.872E+06	1.3615	.4103	33520.8	8296.9	24630.7	7320.7	31313.7	-2.156E-06	7.911E-06
35.00	3.598E+06	1.206E+06	3.964E+06	1.3089	.4386	31577.5	8905.9	22783.1	7537.0	32269.4	-2.044E-06	7.267E-06
36.00	3.335E+06	1.244E+06	4.046E+06	1.2557	.4682	29741.2	9548.3	21099.3	7777.1	33153.3	-1.896E-06	6.618E-06
37.00	3.093E+06	1.286E+06	4.124E+06	1.2022	.4993	28008.1	10226.0	19568.5	8043.5	33958.8	-1.711E-06	5.967E-06
38.00	2.878E+06	1.332E+06	4.192E+06	1.1489	.5318	26372.0	10941.9	18179.4	8339.1	34680.4	-1.488E-06	5.319E-06
39.00	2.681E+06	1.384E+06	4.252E+06	1.0961	.5658	24827.0	11695.2	16921.0	8667.3	35313.4	-1.226E-06	4.676E-06
40.00	2.502E+06	1.441E+06	4.303E+06	1.0441	.6014	23367.6	12491.0	15782.5	9031.6	35854.1	-9.233E-07	4.043E-06
41.00	2.341E+06	1.505E+06	4.346E+06	.9932	.6386	21988.6	13330.9	14753.7	9436.0	36299.8	-5.809E-07	3.425E-06
42.00	2.195E+06	1.576E+06	4.379E+06	.9436	.6773	20685.2	14217.4	13824.7	9884.9	36648.2	-1.990E-07	2.824E-06
43.00	2.064E+06	1.654E+06	4.402E+06	.8953	.7177	19452.7	15153.3	12986.6	10383.3	36898.1	2.212E-07	2.246E-06
44.00	1.945E+06	1.741E+06	4.417E+06	.8485	.7597	18286.9	16141.7	12230.8	10936.5	37048.3	6.782E-07	1.693E-06
45.00	1.838E+06	1.838E+06	4.421E+06	.8033	.8034	17185.9	17185.7	11549.5	11550.5	37098.3	1.170E-06	1.169E-06

KEVLAR/EPOXY -SPACEWIND-
FIBER COVERAGE RATIO = .25

FIBER PROPERTIES

VF = .5000
WF = .5598
RHOF = .0524
FTU = 325000.0
FCU = 70000.0
UF = .2200

EF = 1.900E+07
EFT = 1.000E+06
GF = 3.000E+06
AF = -2.000E-06
AFT = 3.500E-06

RESIN PROPERTIES

VR = .5000
WR = .4402
RHOR = .0412
FSU = 8000.0

EP = 4.700E+05
AR = 4.000E-05
UR = .3500

COMPOSITE PROPERTIES

RHO = .0117
FTU = 162500.0
FCU = 35000.0
FSU = 8000.0

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	2.434E+06	4.781E+04	5.721E+04	.2850	.0056	40625.0	.0	8750.0	171.6	336.4	-9.861E-07	1.184E-04
1.00	2.432E+06	4.784E+04	5.789E+04	.2989	.0059	40493.8	1.2	8744.2	171.7	358.0	-1.019E-06	1.183E-04
2.00	2.426E+06	4.796E+04	5.992E+04	.3462	.0067	40104.9	4.7	8726.5	172.2	381.3	-1.117E-06	1.179E-04
3.00	2.417E+06	4.817E+04	6.336E+04	.4083	.0081	39472.0	10.5	8695.6	172.9	406.6	-1.280E-06	1.172E-04
4.00	2.403E+06	4.846E+04	6.801E+04	.5016	.0101	38616.7	18.7	8649.8	174.0	434.0	-1.505E-06	1.162E-04
5.00	2.384E+06	4.884E+04	7.401E+04	.6186	.0127	37566.8	29.2	8586.6	175.3	463.8	-1.789E-06	1.150E-04
6.00	2.359E+06	4.931E+04	8.131E+04	.7563	.0158	36353.8	42.2	8503.3	177.0	496.3	-2.123E-06	1.135E-04
7.00	2.327E+06	4.985E+04	8.983E+04	.9116	.0195	35011.2	57.5	8397.0	178.9	531.6	-2.522E-06	1.118E-04
8.00	2.289E+06	5.048E+04	9.955E+04	1.0805	.0238	33572.4	75.3	8264.7	181.2	570.1	-2.961E-06	1.098E-04
9.00	2.242E+06	5.121E+04	1.104E+05	1.2584	.0287	32069.0	95.0	8104.1	183.9	612.0	-3.442E-06	1.076E-04
10.00	2.187E+06	5.204E+04	1.224E+05	1.4403	.0343	30529.7	118.4	7913.5	186.8	657.7	-3.961E-06	1.053E-04
11.00	2.124E+06	5.296E+04	1.354E+05	1.6209	.0404	28979.5	143.8	7692.3	190.1	707.7	-4.508E-06	1.027E-04
12.00	2.052E+06	5.398E+04	1.494E+05	1.7949	.0472	27439.7	171.8	7441.0	193.8	762.1	-5.079E-06	9.994E-05
13.00	1.973E+06	5.511E+04	1.643E+05	1.9571	.0546	25927.3	202.5	7161.6	197.8	821.5	-5.667E-06	9.704E-05
14.00	1.888E+06	5.633E+04	1.801E+05	2.1031	.0628	24455.9	236.1	6857.4	202.3	885.3	-6.266E-06	9.400E-05
15.00	1.797E+06	5.768E+04	1.965E+05	2.2293	.0715	23035.2	272.4	6532.5	207.1	956.9	-6.868E-06	9.083E-05
16.00	1.703E+06	5.914E+04	2.137E+05	2.3332	.0810	21672.5	311.7	6192.2	212.4	1033.8	-7.466E-06	8.756E-05
17.00	1.606E+06	6.072E+04	2.315E+05	2.4136	.0913	20372.3	353.9	5842.2	218.1	1117.3	-8.054E-06	8.420E-05
18.00	1.508E+06	6.244E+04	2.498E+05	2.4689	.1022	19137.1	399.3	5488.0	224.2	1207.9	-8.624E-06	8.076E-05
19.00	1.411E+06	6.429E+04	2.685E+05	2.5011	.1140	17967.9	447.9	5135.2	230.9	1305.8	-9.171E-06	7.727E-05
20.00	1.315E+06	6.628E+04	2.875E+05	2.5110	.1265	16864.2	499.8	4788.6	238.1	1411.3	-9.686E-06	7.373E-05
21.00	1.223E+06	6.842E+04	3.068E+05	2.5008	.1399	15824.7	555.2	4452.3	245.8	1524.5	-1.017E-05	7.016E-05
22.00	1.135E+06	7.072E+04	3.262E+05	2.4727	.1541	14847.6	614.1	4129.6	254.1	1645.4	-1.060E-05	6.659E-05
23.00	1.054E+06	7.321E+04	3.456E+05	2.4295	.1693	13930.2	676.8	3823.0	263.0	1773.6	-1.099E-05	6.301E-05
24.00	9.715E+05	7.585E+04	3.650E+05	2.3737	.1853	13069.8	743.3	3534.0	272.5	1908.6	-1.132E-05	5.944E-05
25.00	8.975E+05	7.869E+04	3.843E+05	2.3077	.2024	12263.6	814.0	3263.6	282.8	2049.7	-1.159E-05	5.590E-05
26.00	8.286E+05	8.174E+04	4.033E+05	2.2340	.2204	11508.3	888.8	3012.0	293.8	2195.7	-1.180E-05	5.239E-05
27.00	7.649E+05	8.501E+04	4.220E+05	2.1546	.2395	10801.0	968.1	2779.1	305.6	2345.3	-1.194E-05	4.893E-05
28.00	7.061E+05	8.852E+04	4.403E+05	2.0713	.2597	10138.8	1052.0	2564.3	318.2	2496.6	-1.200E-05	4.552E-05
29.00	6.520E+05	9.227E+04	4.581E+05	1.9857	.2810	9518.7	1140.7	2366.9	331.7	2647.8	-1.199E-05	4.218E-05
30.00	6.025E+05	9.629E+04	4.752E+05	1.8990	.3035	8937.9	1234.6	2185.8	346.2	2796.7	-1.189E-05	3.890E-05
31.00	5.574E+05	1.006E+05	4.917E+05	1.8122	.3273	8393.8	1333.8	2020.0	361.8	2941.2	-1.171E-05	3.570E-05
32.00	5.166E+05	1.052E+05	5.075E+05	1.7263	.3524	7883.9	1438.7	1868.4	378.5	3079.1	-1.144E-05	3.259E-05
33.00	4.775E+05	1.102E+05	5.224E+05	1.6418	.3789	7405.9	1549.5	1729.9	396.4	3208.5	-1.108E-05	2.956E-05
34.00	4.428E+05	1.155E+05	5.363E+05	1.5593	.4069	6957.6	1666.6	1603.4	415.6	3327.7	-1.062E-05	2.662E-05
35.00	4.111E+05	1.213E+05	5.494E+05	1.4792	.4363	6537.0	1790.3	1487.9	436.3	3435.6	-1.007E-05	2.378E-05
36.00	3.821E+05	1.274E+05	5.613E+05	1.4016	.4674	6142.0	1921.0	1382.4	458.6	3531.5	-9.413E-06	2.104E-05
37.00	3.556E+05	1.340E+05	5.722E+05	1.3269	.5001	5771.0	2059.2	1286.1	482.5	3614.9	-8.656E-06	1.841E-05
38.00	3.314E+05	1.412E+05	5.819E+05	1.2550	.5346	5422.3	2205.1	1198.0	508.2	3686.1	-7.794E-06	1.588E-05
39.00	3.092E+05	1.488E+05	5.905E+05	1.1861	.5709	5094.3	2359.4	1117.4	536.0	3745.4	-6.825E-06	1.346E-05
40.00	2.889E+05	1.571E+05	5.978E+05	1.1201	.6092	4785.8	2522.6	1043.6	565.9	3793.6	-5.750E-06	1.115E-05
41.00	2.703E+05	1.661E+05	6.038E+05	1.0571	.6495	4495.3	2695.1	975.9	598.3	3831.5	-4.565E-06	8.952E-06
42.00	2.532E+05	1.757E+05	6.085E+05	.9970	.6920	4221.7	2877.6	913.9	633.2	3859.8	-3.269E-06	6.866E-06
43.00	2.375E+05	1.862E+05	6.118E+05	.9396	.7367	3963.8	3070.7	856.9	671.0	3879.5	-1.862E-06	4.893E-06
44.00	2.230E+05	1.975E+05	6.139E+05	.8850	.7837	3720.7	3275.1	804.5	712.0	3891.0	-3.424E-07	3.033E-06
45.00	2.097E+05	2.097E+05	6.146E+05	.8330	.8331	3491.3	3491.7	756.3	756.4	3894.8	1.290E-06	1.288E-06

KEVLAR/EPOXY SPACEWIND-
FIBER COVERAGE RATIO = .375

FIBER PROPERTIES				RESIN PROPERTIES				COMPOSITE PROPERTIES	
VF = .5000	EF = .190E+08	VR = .5000	ER = .471E+06	RHO= .0176
WF = .5598	EFT= .100E+07	WR = .4402	AR = .400E-04	FTU= 162500.0
RHOF= .0524	GF = .300E+06	RHOR= .0412	UR = .3500	FCU= 35000.0
FTU = 325000.0	AF = -.200E-05	FSU = 8000.0		FSU= 6000.0
FCU = 70000.0	AFT= .330E-04			
UF = .2200				

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	.3651E+07	.1075E+06	.8581E+05	.2850	.0084	60937.5	-.0	13125.0	385.8	505.9	-.9861E-06	.7895E-04
1.00	.3648E+07	.1076E+06	.8684E+05	.2943	.0087	60740.7	1.7	13116.3	385.9	537.9	-.1008E-05	.7889E-04
2.00	.3640E+07	.1077E+06	.8990E+05	.3222	.0095	60157.3	7.0	13090.0	386.4	572.8	-.1074E-05	.7873E-04
3.00	.3626E+07	.1079E+06	.9503E+05	.3683	.0110	59208.0	15.7	13044.8	387.1	611.2	-.1184E-05	.7846E-04
4.00	.3606E+07	.1082E+06	.1021E+06	.4320	.0130	57925.1	28.0	12978.9	388.1	653.2	-.1336E-05	.7807E-04
5.00	.3578E+07	.1086E+06	.1112E+06	.5124	.0155	56350.2	43.8	12889.7	389.4	699.3	-.1530E-05	.7758E-04
6.00	.3543E+07	.1090E+06	.1222E+06	.6081	.0187	54530.7	63.2	12774.4	391.1	749.9	-.1765E-05	.7698E-04
7.00	.3500E+07	.1096E+06	.1350E+06	.7177	.0225	52516.8	86.3	12629.7	393.0	805.5	-.2038E-05	.7628E-04
8.00	.3447E+07	.1102E+06	.1497E+06	.8391	.0268	50358.6	113.0	12452.2	395.3	866.6	-.2349E-05	.7546E-04
9.00	.3385E+07	.1109E+06	.1661E+06	.9699	.0318	48103.5	143.4	12238.9	397.9	933.6	-.2694E-05	.7455E-04
10.00	.3311E+07	.1117E+06	.1841E+06	1.1072	.0374	45794.5	177.6	11987.1	400.9	1007.3	-.3072E-05	.7352E-04
11.00	.3227E+07	.1127E+06	.2038E+06	1.2479	.0436	43469.3	215.7	11695.1	404.3	1088.0	-.3479E-05	.7239E-04
12.00	.3131E+07	.1137E+06	.2249E+06	1.3888	.0504	41159.6	257.8	11362.3	408.0	1176.6	-.3912E-05	.7116E-04
13.00	.3025E+07	.1148E+06	.2474E+06	1.5261	.0579	38891.0	303.9	10989.4	412.1	1273.5	-.4368E-05	.6983E-04
14.00	.2908E+07	.1161E+06	.2711E+06	1.6566	.0661	36683.8	354.1	10578.7	416.7	1379.5	-.4843E-05	.6840E-04
15.00	.2783E+07	.1175E+06	.2960E+06	1.7769	.0750	34552.8	408.6	10133.9	421.7	1495.1	-.5333E-05	.6687E-04
16.00	.2651E+07	.1190E+06	.3219E+06	1.8843	.0846	32508.8	467.5	9660.3	427.2	1620.8	-.5834E-05	.6525E-04
17.00	.2513E+07	.1207E+06	.3487E+06	1.9765	.0949	30558.5	530.9	9164.1	433.2	1757.2	-.6340E-05	.6354E-04
18.00	.2371E+07	.1225E+06	.3762E+06	2.0518	.1060	28705.7	599.0	8652.5	439.7	1904.5	-.6847E-05	.6174E-04
19.00	.2227E+07	.1245E+06	.4044E+06	2.1093	.1179	26951.8	671.8	8133.0	446.8	2063.1	-.7349E-05	.5985E-04
20.00	.2084E+07	.1266E+06	.4331E+06	2.1488	.1305	25296.3	749.7	7612.8	454.6	2232.7	-.7841E-05	.5788E-04
21.00	.1943E+07	.1289E+06	.4622E+06	2.1706	.1440	23737.1	832.7	7099.0	463.0	2413.2	-.8316E-05	.5583E-04
22.00	.1806E+07	.1314E+06	.4915E+06	2.1758	.1584	22271.3	921.2	6597.6	472.1	2604.0	-.8769E-05	.5371E-04
23.00	.1674E+07	.1342E+06	.5208E+06	2.1656	.1736	20895.3	1015.2	6113.9	482.0	2804.2	-.9193E-05	.5152E-04
24.00	.1547E+07	.1372E+06	.5501E+06	2.1417	.1898	19604.8	1115.0	5652.0	492.7	3012.3	-.9581E-05	.4927E-04
25.00	.1428E+07	.1404E+06	.5791E+06	2.1058	.2070	18395.3	1220.9	5214.7	504.4	3226.9	-.9927E-05	.4697E-04
26.00	.1316E+07	.1439E+06	.6078E+06	2.0599	.2252	17262.4	1333.2	4804.2	517.0	3445.7	-.1022E-04	.4461E-04
27.00	.1212E+07	.1477E+06	.6360E+06	2.0058	.2444	16201.6	1452.1	4421.3	530.7	3666.6	-.1047E-04	.4221E-04
28.00	.1115E+07	.1518E+06	.6636E+06	1.9451	.2647	15208.2	1578.0	4066.3	545.5	3886.8	-.1064E-04	.3978E-04
29.00	.1026E+07	.1562E+06	.6904E+06	1.8795	.2862	14278.0	1711.1	3738.9	561.6	4103.7	-.1075E-04	.3732E-04
30.00	.9446E+06	.1610E+06	.7163E+06	1.8103	.3088	13406.8	1851.9	3438.2	579.1	4314.5	-.1078E-04	.3484E-04
31.00	.8690E+06	.1663E+06	.7412E+06	1.7388	.3327	12590.7	2000.7	3162.9	598.1	4516.5	-.1073E-04	.3234E-04
32.00	.8004E+06	.1720E+06	.7649E+06	1.6659	.3580	11825.9	2158.0	2911.6	618.7	4707.6	-.1059E-04	.2985E-04
33.00	.7380E+06	.1782E+06	.7874E+06	1.5927	.3845	11108.9	2324.3	2682.7	641.1	4885.5	-.1035E-04	.2736E-04
34.00	.6811E+06	.1849E+06	.8085E+06	1.5198	.4126	10436.5	2499.9	2474.6	665.5	5048.9	-.1002E-04	.2488E-04
35.00	.6295E+06	.1922E+06	.8281E+06	1.4477	.4421	9805.4	2685.5	2285.7	692.1	5196.6	-.9574E-05	.2243E-04
36.00	.5827E+06	.2002E+06	.8462E+06	1.3770	.4731	9213.0	2881.6	2114.3	721.0	5328.1	-.9021E-05	.2002E-04
37.00	.5402E+06	.2089E+06	.8626E+06	1.3079	.5059	8656.5	3088.7	1958.9	752.5	5443.1	-.8354E-05	.1765E-04
38.00	.5016E+06	.2184E+06	.8772E+06	1.2408	.5403	8133.4	3307.7	1818.0	786.9	5542.1	-.7571E-05	.1533E-04
39.00	.4666E+06	.2288E+06	.8901E+06	1.1759	.5765	7641.5	3539.2	1690.3	824.5	5625.6	-.6668E-05	.1307E-04
40.00	.4349E+06	.2401E+06	.9011E+06	1.1132	.6145	7178.7	3783.8	1574.5	865.6	5694.2	-.5645E-05	.1088E-04
41.00	.4061E+06	.2525E+06	.9102E+06	1.0529	.6545	6743.0	4042.6	1469.5	910.5	5748.8	-.4500E-05	.8773E-05
42.00	.3799E+06	.2660E+06	.9173E+06	.9949	.6966	6332.5	4316.4	1374.2	959.7	5790.3	-.3235E-05	.6749E-05
43.00	.3562E+06	.2809E+06	.9223E+06	.9394	.7407	5945.7	4606.0	1287.7	1013.7	5819.4	-.1851E-05	.4819E-05
44.00	.3346E+06	.2971E+06	.9254E+06	.8862	.7870	5581.0	4912.7	1209.2	1072.9	5836.5	-.3496E-06	.2989E-05
45.00	.3150E+06	.3150E+06	.9264E+06	.8354	.8355	5236.9	5237.5	1137.8	1137.9	5842.2	.1266E-05	.1263E-05

KEVLAR/EPOXY -SPACEWIND-
FIBER COVERAGE RATIO = .500

FIBER PROPERTIES		RESIN PROPERTIES		COMPOSITE PROPERTIES
VF = .5000	EF = 1.900E+07	VR = .5000	ER = 4.700E+05	RHO= .0234
WF = .5598	EFT= 1.000E+06	WR = .4402	AR = 4.600E-05	FTU= 162500.0
RHOF= .0524	GF = 3.000E+06	RHOR= .0412	UR = .3500	FCU= 35000.0
FTU = 325000.0	AF =-2.000E-06	FSU = 8000.0		FSU= 8000.0
FCU = 70000.0	AFT= 5.300E-05			
UF = .2200				

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	4.867E+06	1.912E+06	1.144E+06	.2856	.0112	81250.0	.0	17500.0	685.3	676.3	-9.861E-07	5.921E-05
1.00	4.864E+06	1.912E+06	1.158E+06	.2921	.0115	80987.6	2.3	17488.5	685.4	718.4	-1.003E-06	5.918E-05
2.00	4.853E+06	1.913E+06	1.199E+06	.3132	.0123	80209.7	9.3	17453.6	685.7	765.0	-1.053E-06	5.910E-05
3.00	4.835E+06	1.914E+06	1.267E+06	.3482	.0136	78944.0	21.0	17394.0	686.1	816.6	-1.135E-06	5.897E-05
4.00	4.809E+06	1.916E+06	1.362E+06	.3967	.0158	77233.5	37.3	17308.1	686.8	873.8	-1.251E-06	5.878E-05
5.00	4.773E+06	1.918E+06	1.484E+06	.4582	.0184	75133.6	58.4	17193.1	687.6	937.0	-1.398E-06	5.854E-05
6.00	4.728E+06	1.921E+06	1.631E+06	.5319	.0216	72707.6	84.3	17046.1	688.7	1007.0	-1.578E-06	5.825E-05
7.00	4.673E+06	1.925E+06	1.804E+06	.6169	.0254	70022.5	115.0	16863.7	689.9	1084.4	-1.788E-06	5.789E-05
8.00	4.607E+06	1.929E+06	2.003E+06	.7119	.0298	67144.9	150.6	16642.2	691.4	1170.0	-2.028E-06	5.749E-05
9.00	4.529E+06	1.933E+06	2.228E+06	.8155	.0348	64138.0	191.2	16378.1	693.2	1264.4	-2.298E-06	5.702E-05
10.00	4.437E+06	1.939E+06	2.482E+06	.9258	.0405	61059.3	236.8	16068.3	695.2	1368.6	-2.595E-06	5.649E-05
11.00	4.333E+06	1.945E+06	2.726E+06	1.0419	.0467	57959.1	287.6	15710.3	697.5	1483.3	-2.919E-06	5.591E-05
12.00	4.215E+06	1.952E+06	3.009E+06	1.1583	.0537	54879.4	343.7	15302.6	700.1	1609.3	-3.267E-06	5.526E-05
13.00	4.084E+06	1.960E+06	3.310E+06	1.2756	.0612	51854.7	405.2	14845.1	703.0	1747.4	-3.638E-06	5.454E-05
14.00	3.939E+06	1.969E+06	3.628E+06	1.3903	.0695	48911.7	472.2	14339.0	706.3	1898.3	-4.030E-06	5.377E-05
15.00	3.783E+06	1.979E+06	3.962E+06	1.4997	.0785	46070.5	544.8	13787.4	709.9	2062.8	-4.439E-06	5.292E-05
16.00	3.616E+06	1.990E+06	4.309E+06	1.6014	.0882	43345.1	623.3	13195.0	714.1	2241.4	-4.865E-06	5.201E-05
17.00	3.440E+06	2.003E+06	4.668E+06	1.6931	.0986	40744.7	707.9	12568.1	718.6	2434.3	-5.302E-06	5.103E-05
18.00	3.258E+06	2.017E+06	5.038E+06	1.7731	.1098	38274.3	798.6	11914.1	723.7	2641.8	-5.748E-06	4.997E-05
19.00	3.072E+06	2.032E+06	5.416E+06	1.8398	.1217	35935.8	895.8	11241.5	729.4	2863.7	-6.198E-06	4.885E-05
20.00	2.884E+06	2.050E+06	5.801E+06	1.8924	.1345	33728.3	999.6	10559.5	735.7	3099.6	-6.649E-06	4.764E-05
21.00	2.696E+06	2.069E+06	6.193E+06	1.9304	.1481	31649.5	1110.3	9876.8	742.7	3348.6	-7.095E-06	4.637E-05
22.00	2.512E+06	2.091E+06	6.582E+06	1.9538	.1626	29695.1	1228.2	9202.2	750.4	3609.4	-7.532E-06	4.502E-05
23.00	2.331E+06	2.114E+06	6.970E+06	1.9633	.1780	27860.4	1353.6	8543.3	759.0	3881.6	-7.953E-06	4.359E-05
24.00	2.159E+06	2.141E+06	7.368E+06	1.9595	.1943	26139.7	1486.7	7906.8	768.5	4159.8	-8.352E-06	4.209E-05
25.00	1.992E+06	2.169E+06	7.758E+06	1.9437	.2116	24527.1	1627.9	7298.1	779.0	4444.7	-8.722E-06	4.051E-05
26.00	1.835E+06	2.201E+06	8.142E+06	1.9172	.2299	23016.6	1777.6	6721.3	790.7	4732.5	-9.057E-06	3.885E-05
27.00	1.688E+06	2.236E+06	8.521E+06	1.8814	.2493	21602.1	1936.1	6179.2	803.7	5021.1	-9.349E-06	3.713E-05
28.00	1.551E+06	2.276E+06	8.891E+06	1.8378	.2697	20277.6	2103.9	5673.5	818.0	5304.3	-9.589E-06	3.533E-05
29.00	1.423E+06	2.319E+06	9.249E+06	1.7877	.2913	19037.3	2281.5	5204.6	833.9	5581.8	-9.770E-06	3.347E-05
30.00	1.306E+06	2.367E+06	9.597E+06	1.7326	.3142	17875.7	2469.2	4772.5	851.4	5849.8	-9.883E-06	3.155E-05
31.00	1.199E+06	2.421E+06	9.933E+06	1.6735	.3381	16787.6	2667.6	4376.1	870.9	6105.2	-9.919E-06	2.957E-05
32.00	1.101E+06	2.481E+06	1.025E+07	1.6117	.3635	15767.9	2877.4	4014.0	892.5	6345.7	-9.871E-06	2.754E-05
33.00	1.011E+06	2.546E+06	1.055E+07	1.5481	.3901	14811.9	3099.0	3684.5	916.5	6569.3	-9.729E-06	2.547E-05
34.00	9.291E+05	2.619E+06	1.083E+07	1.4834	.4182	13915.3	3333.2	3385.4	943.0	6774.5	-9.486E-06	2.336E-05
35.00	8.553E+05	2.700E+06	1.110E+07	1.4185	.4478	13073.9	3580.6	3114.7	972.5	6961.3	-9.134E-06	2.123E-05
36.00	7.887E+05	2.790E+06	1.134E+07	1.3539	.4789	12284.0	3842.1	2870.1	1005.1	7125.2	-8.666E-06	1.909E-05
37.00	7.288E+05	2.889E+06	1.156E+07	1.2901	.5115	11542.0	4118.3	2649.9	1041.4	7272.2	-8.077E-06	1.695E-05
38.00	6.745E+05	3.000E+06	1.175E+07	1.2274	.5459	10844.5	4411.3	2451.8	1081.6	7398.6	-7.363E-06	1.481E-05
39.00	6.257E+05	3.122E+06	1.193E+07	1.1661	.5819	10188.7	4718.9	2272.0	1126.3	7505.9	-6.519E-06	1.270E-05
40.00	5.819E+05	3.259E+06	1.207E+07	1.1065	.6198	9571.6	5045.1	2111.2	1176.0	7594.9	-5.545E-06	1.063E-05
41.00	5.423E+05	3.411E+06	1.220E+07	1.0488	.6595	8990.2	5390.2	1966.7	1231.2	7666.2	-4.439E-06	8.601E-06
42.00	5.068E+05	3.579E+06	1.229E+07	.9929	.7011	8443.4	5755.1	1836.8	1292.6	7720.8	-3.203E-06	6.637E-06
43.00	4.749E+05	3.766E+06	1.236E+07	.9391	.7446	7927.7	6141.4	1720.2	1360.9	7759.2	-1.840E-06	4.748E-06
44.00	4.463E+05	3.974E+06	1.240E+07	.8874	.7902	7441.4	6550.3	1615.4	1436.9	7782.1	-3.565E-07	2.945E-06
45.00	4.205E+05	4.206E+06	1.241E+07	.8377	.8378	6982.6	6983.3	1521.3	1521.5	7789.6	1.242E-06	1.240E-06

KEVLAR/EPOXY SPACEWIND-
FIBER COVERAGE RATIO = .625

FIBER PROPERTIES				RESIN PROPERTIES				COMPOSITE PROPERTIES	
VF = .5000	EF = .190E+08			VR = .5000	ER = .470E+06			RHO= .0293	
WF = .5598	EFT= .100E+07			WR = .4402	AR = .400E-04			FTU= 162500.0	
RHOF= .0524	GF = .300E+06			RHOR= .0412	JR = .3500			FCU= 35000.0	
FTU = 325000.0	AF = -.200E-05			FSU = 8000.0				FSU= 8000.0	
FCU = 70000.0	AFT= .330E-04								
UF = .2240									

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	.6084E+07	.2987E+06	.1430E+06	.2850	.0140	111562.5	-.0	21875.0	1070.0	847.4	-.9861E-06	.4737E-04
1.00	.6086E+07	.2987E+06	.1447E+06	.2907	.0143	111234.5	2.9	21860.6	1070.0	899.6	-.9995E-06	.4735E-04
2.00	.6066E+07	.2987E+06	.1499E+06	.3078	.0152	110262.1	11.6	21817.1	1069.9	957.9	-.10 E-05	.4731E-04
3.00	.6043E+07	.2987E+06	.1545E+06	.3361	.0166	98679.9	26.2	21743.4	1069.9	1023.0	-.110 E-05	.4724E-04
4.00	.6011E+07	.2987E+06	.1705E+06	.3754	.0187	96541.8	46.7	21637.4	1069.8	1095.7	-.1199E-05	.4714E-04
5.00	.5967E+07	.2986E+06	.1857E+06	.4254	.0213	93917.0	73.0	21498.7	1069.7	1176.9	-.1310E-05	.4701E-04
6.00	.5913E+07	.2986E+06	.2042E+06	.4855	.0245	90884.5	105.4	21318.2	1069.6	1267.3	-.1464E-05	.4685E-04
7.00	.5846E+07	.2985E+06	.2259E+06	.5551	.0283	87528.1	143.8	21098.4	1069.5	1367.9	-.1635E-05	.4665E-04
8.00	.5766E+07	.2985E+06	.2506E+06	.6334	.0328	83931.1	188.3	20833.4	1069.4	1479.6	-.1831E-05	.4643E-04
9.00	.5673E+07	.2985E+06	.2783E+06	.7194	.0379	80172.5	239.0	20519.5	1069.4	1603.5	-.2052E-05	.4617E-04
10.00	.5564E+07	.2985E+06	.3087E+06	.8118	.0435	76324.2	296.0	20153.2	1069.5	1740.5	-.2298E-05	.4587E-04
11.00	.5446E+07	.2985E+06	.3416E+06	.9091	.0499	72446.8	359.5	19731.6	1069.6	1891.6	-.2566E-05	.4554E-04
12.00	.5306E+07	.2985E+06	.3773E+06	1.0098	.0569	68599.3	429.6	19252.4	1069.9	2057.8	-.2858E-05	.4516E-04
13.00	.5145E+07	.2986E+06	.4152E+06	1.1118	.0645	64818.4	506.5	18714.8	1070.3	2239.9	-.3170E-05	.4475E-04
14.00	.4974E+07	.2987E+06	.4552E+06	1.2134	.0729	61139.6	590.2	18119.4	1070.9	2438.8	-.3503E-05	.4429E-04
15.00	.4789E+07	.2989E+06	.4971E+06	1.3124	.0819	57588.1	681.0	17468.5	1071.7	2654.9	-.3855E-05	.4379E-04
16.00	.4596E+07	.2992E+06	.5408E+06	1.4067	.0917	54181.3	779.2	16766.1	1072.8	2888.8	-.4223E-05	.4324E-04
17.00	.4396E+07	.2996E+06	.5859E+06	1.4944	.1022	50930.8	884.8	16018.2	1074.3	3140.6	-.4606E-05	.4264E-04
18.00	.4190E+07	.3000E+06	.6324E+06	1.5737	.1135	47842.9	998.3	15232.2	1076.1	3410.0	-.5001E-05	.4198E-04
19.00	.3984E+07	.3006E+06	.6799E+06	1.6431	.1256	44919.7	1119.7	14417.2	1078.4	3696.6	-.5406E-05	.4127E-04
20.00	.3783E+07	.3014E+06	.7283E+06	1.7014	.1385	42160.4	1249.5	13583.1	1081.2	3999.2	-.5816E-05	.4049E-04
21.00	.3471E+07	.3022E+06	.7772E+06	1.7477	.1522	39561.8	1387.9	12740.2	1084.6	4316.5	-.6229E-05	.3966E-04
22.00	.3240E+07	.3033E+06	.8265E+06	1.7817	.1668	37118.9	1535.3	11898.9	1088.8	4646.5	-.6640E-05	.3875E-04
23.00	.3013E+07	.3047E+06	.8760E+06	1.8032	.1823	34825.5	1692.0	11069.3	1093.7	4987.0	-.7045E-05	.3778E-04
24.00	.2793E+07	.3062E+06	.9253E+06	1.8127	.1988	32674.6	1858.4	10260.3	1099.6	5335.0	-.7437E-05	.3673E-04
25.00	.2584E+07	.3081E+06	.9742E+06	1.8107	.2162	30658.9	2034.9	9479.8	1106.5	5687.5	-.7810E-05	.3561E-04
26.00	.2387E+07	.3103E+06	.1023E+07	1.7981	.2346	28776.7	2222.0	8734.0	1114.7	6041.0	-.8159E-05	.3442E-04
27.00	.2186E+07	.3128E+06	.1071E+07	1.7760	.2541	27002.6	2420.2	8028.0	1124.2	6392.0	-.8474E-05	.3314E-04
28.00	.2007E+07	.3158E+06	.1117E+07	1.7454	.2747	25347.0	2629.9	7365.1	1135.3	6736.8	-.8749E-05	.3178E-04
29.00	.1839E+07	.3193E+06	.1162E+07	1.7076	.2964	23796.8	2851.8	6747.4	1148.1	7072.0	-.8974E-05	.3035E-04
30.00	.1684E+07	.3233E+06	.1205E+07	1.6638	.3194	22344.7	3086.5	6175.6	1162.9	7394.2	-.9140E-05	.2883E-04
31.00	.1542E+07	.3279E+06	.1247E+07	1.6152	.3435	20984.5	3334.6	5649.5	1180.0	7700.6	-.9238E-05	.2724E-04
32.00	.1412E+07	.3333E+06	.1287E+07	1.5627	.3689	19709.8	3596.7	5168.0	1199.6	7988.6	-.9256E-05	.2557E-04
33.00	.1293E+07	.3394E+06	.1325E+07	1.5073	.3957	18514.9	3873.8	4729.5	1222.1	8256.3	-.9186E-05	.2382E-04
34.00	.1185E+07	.3464E+06	.1361E+07	1.4503	.4238	17394.1	4166.5	4331.6	1247.8	8502.2	-.9017E-05	.2202E-04
35.00	.1088E+07	.3544E+06	.1394E+07	1.3915	.4534	16342.4	4475.8	3972.0	1277.2	8725.3	-.8739E-05	.2016E-04
36.00	.9997E+06	.3635E+06	.1424E+07	1.3324	.4845	15355.0	4802.6	3647.9	1310.7	8925.2	-.8344E-05	.1825E-04
37.00	.9217E+06	.3739E+06	.1452E+07	1.2733	.5172	14427.4	5147.9	3356.7	1348.8	9101.8	-.7823E-05	.1630E-04
38.00	.8498E+06	.3858E+06	.1477E+07	1.2147	.5514	13555.7	5512.8	3095.6	1392.2	9255.4	-.7170E-05	.1433E-04
39.00	.7863E+06	.3992E+06	.1498E+07	1.1568	.5873	12735.9	5898.6	2862.0	1441.4	9386.4	-.6379E-05	.1236E-04
40.00	.7296E+06	.4144E+06	.1517E+07	1.1002	.6249	11964.5	6306.4	2653.4	1497.2	9495.6	-.5449E-05	.1038E-04
41.00	.6789E+06	.4317E+06	.1533E+07	1.0448	.6643	11238.3	6737.7	2467.3	1560.4	9583.7	-.4379E-05	.8436E-05
42.00	.6338E+06	.4512E+06	.1544E+07	.9910	.7055	10554.2	7193.9	2301.6	1631.9	9651.3	-.3171E-05	.6529E-05
43.00	.5937E+06	.4733E+06	.1551E+07	.9389	.7485	9909.6	7676.7	2154.3	1712.8	9699.1	-.1830E-05	.4679E-05
44.00	.5580E+06	.4982E+06	.1556E+07	.8885	.7933	9301.7	8187.8	2023.3	1804.1	9727.6	-.3633E-06	.2903E-05
45.00	.5263E+06	.5263E+06	.1559E+07	.8400	.8401	8728.2	8729.1	1907.0	1907.2	9737.0	.1220E-05	.1217E-05

KEVLAR/EPOXY -SPACEWIND-
FIBER COVERAGE RATIO = .750

FIBER PROPERTIES

VF = .5000 EF = 1.900E+07
WF = .5598 EFT= 1.000E+06
RHOF= .0524 GF = 3.000E+05
FTU = 325000.0 AF =-2.000E-06
FCU = 70000.0 AFT= 3.300E-05
UF = .2200

RESIN PROPERTIES

VR = .5000 ER = 4.700E+05
WR = .4402 AR = 4.000E-05
RHOR= .0412 UR = .3500
FSU = 8000.0

COMPOSITE PROPERTIES

RHO= .0351
FTU= 162500.0
FCU= 35000.0
FSU= 8000.0

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	7.301E+06	4.302E+05	1.716E+05	.2850	.0168	121875.0	.0	26250.0	1539.7	1019.4	-9.861E-07	3.947E-05
1.00	7.296E+06	4.301E+05	1.737E+05	.2898	.0171	121481.4	3.5	26232.8	1539.5	1081.4	-9.973E-07	3.947E-05
2.00	7.280E+06	4.301E+05	1.799E+05	.3042	.0180	120314.6	14.0	26180.8	1539.0	1151.3	-1.031E-06	3.944E-05
3.00	7.252E+06	4.297E+05	1.903E+05	.3280	.0194	118415.9	31.5	26092.7	1538.2	1230.2	-1.087E-06	3.940E-05
4.00	7.213E+06	4.294E+05	2.047E+05	.3612	.0215	115850.2	56.0	25966.9	1537.0	1319.0	-1.165E-06	3.934E-05
5.00	7.162E+06	4.290E+05	2.232E+05	.4034	.0242	112700.4	87.6	25800.6	1535.5	1418.8	-1.265E-06	3.927E-05
6.00	7.098E+06	4.284E+05	2.455E+05	.4543	.0274	109061.4	126.5	25590.7	1533.6	1530.6	-1.387E-06	3.918E-05
7.00	7.019E+06	4.278E+05	2.716E+05	.5134	.0313	105033.7	172.5	25333.6	1531.5	1655.7	-1.532E-06	3.907E-05
8.00	6.926E+06	4.271E+05	3.015E+05	.5801	.0358	100717.3	225.9	25025.5	1529.1	1795.1	-1.698E-06	3.894E-05
9.00	6.817E+06	4.263E+05	3.348E+05	.6538	.0409	96207.0	286.8	24662.4	1526.5	1950.2	-1.885E-06	3.879E-05
10.00	6.691E+06	4.255E+05	3.715E+05	.7334	.0466	91589.0	355.2	24240.5	1523.6	2122.0	-2.094E-06	3.861E-05
11.00	6.549E+06	4.246E+05	4.114E+05	.8179	.0530	86938.6	431.4	23756.4	1520.5	2311.6	-2.324E-06	3.841E-05
12.00	6.387E+06	4.236E+05	4.543E+05	.9061	.0601	82319.1	515.5	23207.7	1517.2	2520.2	-2.575E-06	3.819E-05
13.00	6.209E+06	4.226E+05	5.000E+05	.9964	.0678	77782.0	607.7	22592.8	1513.8	2748.6	-2.845E-06	3.794E-05
14.00	6.012E+06	4.216E+05	5.483E+05	1.0874	.0762	73367.6	708.2	21911.8	1510.3	2997.5	-3.134E-06	3.766E-05
15.00	5.799E+06	4.205E+05	5.989E+05	1.1773	.0854	69105.7	817.2	21166.2	1506.8	3267.4	-3.442E-06	3.735E-05
16.00	5.569E+06	4.195E+05	6.515E+05	1.2646	.0952	65017.6	935.0	20359.5	1503.3	3559.4	-3.766E-06	3.700E-05
17.00	5.326E+06	4.184E+05	7.061E+05	1.3473	.1059	61117.0	1061.8	19497.3	1499.9	3870.3	-4.107E-06	3.662E-05
18.00	5.071E+06	4.175E+05	7.621E+05	1.4246	.1172	57411.4	1197.9	18586.7	1496.6	4202.6	-4.460E-06	3.620E-05
19.00	4.806E+06	4.165E+05	8.194E+05	1.4932	.1294	53903.6	1343.7	17637.0	1493.6	4554.1	-4.826E-06	3.573E-05
20.00	4.534E+06	4.157E+05	8.777E+05	1.5536	.1424	50592.5	1499.4	16658.5	1490.9	4923.4	-5.201E-06	3.521E-05
21.00	4.259E+06	4.151E+05	9.368E+05	1.6041	.1563	47474.2	1665.5	15662.6	1488.7	5308.3	-5.583E-06	3.465E-05
22.00	3.984E+06	4.144E+05	9.963E+05	1.6442	.1710	44542.7	1842.3	14661.1	1487.0	5705.2	-5.968E-06	3.402E-05
23.00	3.712E+06	4.140E+05	1.056E+06	1.6735	.1866	41790.6	2030.4	13665.7	1486.0	6114.3	-6.351E-06	3.334E-05
24.00	3.445E+06	4.138E+05	1.115E+06	1.6919	.2032	39209.5	2230.0	12687.5	1485.8	6529.1	-6.729E-06	3.260E-05
25.00	3.187E+06	4.139E+05	1.174E+06	1.6996	.2208	36790.7	2441.9	11736.6	1486.6	6946.8	-7.095E-06	3.178E-05
26.00	2.938E+06	4.144E+05	1.233E+06	1.6972	.2393	34524.9	2666.4	10821.6	1488.6	7363.6	-7.445E-06	3.090E-05
27.00	2.702E+06	4.152E+05	1.290E+06	1.6854	.2590	32405.1	2904.2	9949.6	1492.0	7775.6	-7.770E-06	2.993E-05
28.00	2.479E+06	4.164E+05	1.346E+06	1.6651	.2797	30416.4	3155.9	9125.9	1497.1	8179.8	-8.063E-06	2.889E-05
29.00	2.271E+06	4.182E+05	1.401E+06	1.6371	.3015	28556.0	3422.2	8354.4	1504.1	8569.4	-8.315E-06	2.776E-05
30.00	2.077E+06	4.206E+05	1.453E+06	1.6027	.3246	26813.6	3703.8	7637.0	1513.2	8944.2	-8.517E-06	2.655E-05
31.00	1.898E+06	4.237E+05	1.504E+06	1.5627	.3489	25181.4	4001.5	6974.8	1525.0	9300.0	-8.657E-06	2.525E-05
32.00	1.734E+06	4.276E+05	1.552E+06	1.5181	.3743	23651.8	4316.1	6367.2	1539.7	9634.4	-8.726E-06	2.386E-05
33.00	1.584E+06	4.324E+05	1.598E+06	1.4700	.4012	22217.8	4648.5	5812.8	1557.8	9945.2	-8.711E-06	2.239E-05
34.00	1.449E+06	4.383E+05	1.641E+06	1.4191	.4294	20872.9	4999.8	5309.7	1579.7	10231.1	-8.601E-06	2.083E-05
35.00	1.329E+06	4.454E+05	1.681E+06	1.3663	.4590	19610.9	5371.0	4855.1	1606.1	10491.1	-8.384E-06	1.919E-05
36.00	1.225E+06	4.539E+05	1.717E+06	1.3122	.4901	18426.0	5763.1	4446.1	1637.5	10724.7	-8.050E-06	1.748E-05
37.00	1.136E+06	4.639E+05	1.751E+06	1.2575	.5227	17312.9	6177.5	4079.4	1674.6	10931.7	-7.588E-06	1.571E-05
38.00	1.062E+06	4.757E+05	1.781E+06	1.2026	.5569	16266.8	6615.4	3751.8	1718.3	11112.3	-6.989E-06	1.389E-05
39.00	1.003E+06	4.896E+05	1.807E+06	1.1480	.5926	15283.0	7078.3	3460.1	1769.4	11267.0	-6.247E-06	1.203E-05
40.00	8.782E+05	5.057E+05	1.829E+06	1.0941	.6300	14357.4	7567.7	3201.0	1828.8	11396.5	-5.359E-06	1.015E-05
41.00	8.159E+05	5.244E+05	1.847E+06	1.0416	.6691	13485.9	8085.2	2971.5	1897.7	11501.2	-4.323E-06	8.279E-06
42.00	7.663E+05	5.460E+05	1.862E+06	.9892	.7098	12665.1	8632.7	2768.7	1977.3	11581.8	-3.141E-06	6.425E-06
43.00	7.164E+05	5.710E+05	1.872E+06	.9387	.7523	11891.5	9212.1	2589.9	2069.1	11639.0	-1.820E-06	4.612E-06
44.00	6.693E+05	5.996E+05	1.878E+06	.8896	.7964	11162.0	9825.4	2432.8	2174.4	11673.1	-3.698E-07	2.862E-06
45.00	6.323E+05	6.324E+05	1.881E+06	.8422	.8422	10473.9	10475.0	2294.9	2295.1	11684.5	1.197E-06	1.195E-06

KEVLAR/EPOXY SPACEWIND-
FIBER COVERAGE RATIO = .875

FIBER PROPERTIES

VF = .5000
WF = .5598
RHOF= .0524
FTU = 325000.0
FCU = 70000.0
UF = .2200
EF = .190E+08
EFT= .100E+07
GF = .303E+06
AF = -.200E-05
AFT= .332E-04

RESIN PROPERTIES

VR = .5000
WR = .4402
RHOR= .0412
FSU = 8000.0
ER = .470E+06
AR = .400E-04
UR = .3500

COMPOSITE PROPERTIES

RHO= .0410
FTU= 162500.0
FCU= 35000.0
FSU= 8000.0

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	.8518E+07	.5855E+06	.2002E+06	.2854	.0196	142187.5	-.0	30625.0	2094.2	1192.2	-.9861E-06	.3383E-04
1.00	.8512E+07	.5854E+06	.2027E+06	.2892	.0199	141728.2	4.1	30604.9	2093.9	1263.8	-.9957E-06	.3383E-04
2.00	.8493E+07	.5851E+06	.2100E+06	.3016	.0208	140367.0	16.3	30544.4	2092.7	1345.4	-.1025E-05	.3382E-04
3.00	.8461E+07	.5846E+06	.2221E+06	.3222	.0223	138151.9	36.7	30442.2	2090.8	1438.3	-.1073E-05	.3379E-04
4.00	.8416E+07	.5838E+06	.2391E+06	.3509	.0243	135158.6	65.3	30296.4	2088.2	1543.6	-.1140E-05	.3376E-04
5.00	.8356E+07	.5828E+06	.2607E+06	.3876	.0270	131483.8	102.3	30104.6	2084.8	1662.7	-.1226E-05	.3372E-04
6.00	.8282E+07	.5816E+06	.2869E+06	.4318	.0303	127238.3	147.5	29863.4	2080.7	1796.9	-.1332E-05	.3367E-04
7.00	.8192E+07	.5802E+06	.3175E+06	.4833	.0342	122539.3	201.3	29569.3	2075.8	1947.5	-.1457E-05	.3360E-04
8.00	.8086E+07	.5786E+06	.3525E+06	.5416	.0388	117503.5	263.6	29218.3	2070.3	2116.1	-.1601E-05	.3353E-04
9.00	.7962E+07	.5769E+06	.3916E+06	.6062	.0439	112241.5	334.6	28806.3	2064.1	2303.8	-.1765E-05	.3344E-04
10.00	.7819E+07	.5749E+06	.4347E+06	.6763	.0497	106853.9	414.5	28329.3	2057.3	2512.1	-.1947E-05	.3334E-04
11.00	.7657E+07	.5727E+06	.4815E+06	.7511	.0562	101428.4	503.4	27783.8	2049.9	2742.1	-.2148E-05	.3322E-04
12.00	.7475E+07	.5704E+06	.5319E+06	.8296	.0633	96039.0	601.5	27166.7	2041.9	2994.9	-.2368E-05	.3309E-04
13.00	.7273E+07	.5680E+06	.5854E+06	.9107	.0711	90745.7	709.0	26476.3	2033.4	3271.3	-.2606E-05	.3293E-04
14.00	.7052E+07	.5654E+06	.6420E+06	.9931	.0796	85595.5	826.3	25712.0	2024.4	3571.9	-.2862E-05	.3276E-04
15.00	.6811E+07	.5626E+06	.7014E+06	1.0754	.0888	80623.3	953.4	24874.9	2015.0	3896.9	-.3135E-05	.3256E-04
16.00	.6552E+07	.5598E+06	.7631E+06	1.1562	.0988	75853.9	1090.8	23967.9	2005.3	4246.2	-.3425E-05	.3234E-04
17.00	.6277E+07	.5569E+06	.8271E+06	1.2341	.1095	71303.2	1238.8	22995.9	1995.3	4619.1	-.3731E-05	.3210E-04
18.00	.5987E+07	.5539E+06	.8928E+06	1.3075	.1210	66980.0	1397.6	21966.2	1985.1	5014.6	-.4051E-05	.3182E-04
19.00	.5685E+07	.5509E+06	.9600E+06	1.3752	.1333	62887.6	1567.6	20887.6	1974.9	5431.1	-.4384E-05	.3150E-04
20.00	.5374E+07	.5479E+06	.1028E+07	1.4358	.1464	59024.6	1749.3	19770.8	1964.6	5866.5	-.4729E-05	.3115E-04
21.00	.5058E+07	.5451E+06	.1098E+07	1.4883	.1603	55386.6	1943.1	18627.8	1954.6	6318.8	-.5082E-05	.3076E-04
22.00	.4744E+07	.5421E+06	.1168E+07	1.5320	.1752	51966.5	2149.4	17471.6	1944.8	6782.6	-.5442E-05	.3033E-04
23.00	.4423E+07	.5393E+06	.1238E+07	1.5662	.1910	48755.7	2368.8	16315.2	1935.5	7256.8	-.5804E-05	.2984E-04
24.00	.4111E+07	.5367E+06	.1307E+07	1.5906	.2077	45744.4	2601.7	15171.5	1926.8	7736.5	-.6165E-05	.2930E-04
25.00	.3807E+07	.5344E+06	.1377E+07	1.6054	.2253	42922.4	2848.8	14052.5	1919.0	8217.6	-.6521E-05	.2870E-04
26.00	.3513E+07	.5323E+06	.1445E+07	1.6106	.2440	40279.0	3110.8	12969.1	1912.3	8695.9	-.6865E-05	.2803E-04
27.00	.3232E+07	.5306E+06	.1512E+07	1.6068	.2638	37803.6	3388.2	11930.5	1906.9	9167.1	-.7192E-05	.2730E-04
28.00	.2965E+07	.5294E+06	.1578E+07	1.5945	.2846	35485.8	3681.9	10944.1	1903.2	9627.0	-.7493E-05	.2648E-04
29.00	.2715E+07	.5287E+06	.1642E+07	1.5746	.3066	33315.3	3992.6	10015.5	1901.5	10071.7	-.7761E-05	.2559E-04
30.00	.2481E+07	.5286E+06	.1704E+07	1.5479	.3298	31282.6	4321.1	9148.6	1902.2	10497.8	-.7986E-05	.2461E-04
31.00	.2265E+07	.5293E+06	.1763E+07	1.5152	.3541	29378.3	4668.4	8345.3	1905.7	10902.1	-.8157E-05	.2354E-04
32.00	.2066E+07	.5310E+06	.1820E+07	1.4775	.3797	27593.8	5035.4	7606.2	1912.5	11282.8	-.8263E-05	.2237E-04
33.00	.1884E+07	.5336E+06	.1873E+07	1.4356	.4067	25920.8	5423.3	6930.5	1923.2	11635.5	-.8291E-05	.2112E-04
34.00	.1719E+07	.5376E+06	.1924E+07	1.3905	.4349	24351.7	5833.1	6316.6	1938.4	11961.8	-.8229E-05	.1976E-04
35.00	.1569E+07	.5429E+06	.1970E+07	1.3428	.4646	22879.3	6266.1	5761.8	1958.8	12257.5	-.8063E-05	.1831E-04
36.00	.1435E+07	.5499E+06	.2013E+07	1.2933	.4957	21497.0	6723.6	5262.9	1985.2	12524.5	-.7781E-05	.1678E-04
37.00	.1314E+07	.5588E+06	.2053E+07	1.2425	.5282	20198.4	7207.1	4816.5	2018.6	12761.8	-.7370E-05	.1516E-04
38.00	.1207E+07	.5698E+06	.2087E+07	1.1911	.5623	18978.0	7718.0	4418.7	2059.8	12969.4	-.6820E-05	.1347E-04
39.00	.1112E+07	.5833E+06	.2118E+07	1.1396	.5979	17830.2	8258.0	4065.7	2110.1	13147.8	-.6123E-05	.1172E-04
40.00	.1028E+07	.5996E+06	.2144E+07	1.0882	.6350	16750.3	8829.0	3753.7	2170.7	13297.4	-.5273E-05	.9934E-05
41.00	.9533E+06	.6191E+06	.2166E+07	1.0374	.6738	15733.6	9432.8	3478.9	2243.1	13418.7	-.4268E-05	.8128E-05
42.00	.8881E+06	.6423E+06	.2183E+07	.9874	.7141	14775.9	10071.5	3237.9	2328.9	13512.4	-.3112E-05	.6324E-05
43.00	.8312E+06	.6696E+06	.2195E+07	.9385	.7560	13873.4	10747.4	3027.3	2429.8	13578.9	-.1811E-05	.4548E-05
44.00	.7816E+06	.7015E+06	.2202E+07	.8907	.7994	13022.4	11463.0	2843.9	2547.8	13618.7	-.3762E-06	.2823E-05
45.00	.7386E+06	.7386E+06	.2205E+07	.8443	.8444	12219.5	12220.8	2684.9	2685.1	13631.9	.1176E-05	.1173E-05

KEVLAR/EPOXY SPACEWIND-
FIBER COVERAGE RATIO =1.000

FIBER PROPERTIES		RESIN PROPERTIES		COMPOSITE PROPERTIES
VF = .5000	EF = .190E+08	VR = .5000	ER = .470E+06	RHO= .0468
WF = .5598	EFT= .100E+07	WR = .4402	AR = .400E-04	FTU= 162500.0
RHOF= .0524	GF = .330E+06	RHOR= .0412	UR = .3500	FCU= 35000.0
FTU = 325000.0	AF = -.200E-05	FSU = 8000.0		FSU= 8000.0
FCU = 70000.0	AFT= .330E-04			
UF = .2250				

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	.9735E+07	.7640E+06	.2286E+06	.2850	.0224	162500.0	-.0	35000.0	2733.5	1365.9	-.9861E-06	.2961E-04
1.00	.9728E+07	.7646E+06	.2316E+06	.2887	.0227	161975.1	4.7	34977.1	2732.8	1446.9	-.9946E-06	.2960E-04
2.00	.9706E+07	.7641E+06	.2400E+06	.2996	.0236	160419.4	18.6	34908.1	2730.9	1548.2	-.1020E-05	.2960E-04
3.00	.9670E+07	.7631E+06	.2540E+06	.3179	.0251	157887.9	42.0	34791.7	2727.7	1647.2	-.1062E-05	.2958E-04
4.00	.9618E+07	.7618E+06	.2734E+06	.3433	.0272	154466.9	74.7	34626.1	2723.2	1769.4	-.1121E-05	.2957E-04
5.00	.9551E+07	.7602E+06	.2983E+06	.3757	.0299	150267.2	116.9	34408.7	2717.5	1908.5	-.1198E-05	.2954E-04
6.00	.9467E+07	.7582E+06	.3284E+06	.4149	.0332	145415.2	168.6	34136.4	2710.5	2065.9	-.1291E-05	.2952E-04
7.00	.9366E+07	.7558E+06	.3636E+06	.4606	.0372	140044.9	230.0	33805.3	2702.3	2243.2	-.1401E-05	.2948E-04
8.00	.9246E+07	.7531E+06	.4038E+06	.5124	.0417	134289.7	301.2	33411.6	2692.9	2442.1	-.1528E-05	.2944E-04
9.00	.9106E+07	.7501E+06	.4488E+06	.5700	.0470	128276.0	382.4	32951.8	2682.3	2663.9	-.1673E-05	.2939E-04
10.00	.8947E+07	.7467E+06	.4983E+06	.6328	.0528	122118.7	473.7	32419.4	2670.5	2910.2	-.1835E-05	.2933E-04
11.00	.8766E+07	.7430E+06	.5521E+06	.7000	.0593	115918.1	575.3	31813.8	2657.7	3182.1	-.2014E-05	.2926E-04
12.00	.8563E+07	.7390E+06	.6099E+06	.7708	.0665	109758.8	687.4	31128.6	2643.8	3480.6	-.2210E-05	.2919E-04
13.00	.8339E+07	.7347E+06	.6715E+06	.8445	.0744	103709.4	810.3	30363.9	2628.9	3806.4	-.2423E-05	.2909E-04
14.00	.8093E+07	.7301E+06	.7365E+06	.9198	.0830	97823.4	944.3	29518.8	2613.0	4159.9	-.2652E-05	.2899E-04
15.00	.7825E+07	.7252E+06	.8047E+06	.9957	.0923	92140.9	1089.6	28591.5	2596.2	4541.1	-.2898E-05	.2887E-04
16.00	.7537E+07	.7202E+06	.8756E+06	1.0709	.1023	86690.1	1246.7	27586.9	2578.6	4949.3	-.3161E-05	.2873E-04
17.00	.7230E+07	.7149E+06	.9491E+06	1.1442	.1131	81489.3	1415.7	26508.7	2560.3	5383.6	-.3438E-05	.2857E-04
18.00	.6907E+07	.7094E+06	.1025E+07	1.2143	.1247	76548.6	1597.2	25363.7	2541.4	5842.4	-.3731E-05	.2838E-04
19.00	.6569E+07	.7038E+06	.1102E+07	1.2798	.1371	71871.5	1791.6	24160.7	2521.9	6323.6	-.4036E-05	.2818E-04
20.00	.6221E+07	.6981E+06	.1181E+07	1.3397	.1503	67456.7	1999.2	22910.4	2502.1	6824.4	-.4354E-05	.2794E-04
21.00	.5865E+07	.6922E+06	.1261E+07	1.3929	.1644	63298.9	2220.7	21625.3	2482.1	7341.7	-.4683E-05	.2767E-04
22.00	.5505E+07	.6864E+06	.1342E+07	1.4385	.1794	59390.2	2456.5	20319.1	2462.0	7871.8	-.5019E-05	.2736E-04
23.00	.5145E+07	.6806E+06	.1421E+07	1.4759	.1953	55720.7	2707.2	19005.9	2442.0	8410.7	-.5361E-05	.2701E-04
24.00	.4788E+07	.6749E+06	.1501E+07	1.5046	.2121	52279.3	2973.4	17700.3	2422.4	8953.9	-.5706E-05	.2661E-04
25.00	.4438E+07	.6693E+06	.1580E+07	1.5245	.2299	49054.2	3255.8	16415.8	2403.5	9496.9	-.6048E-05	.2617E-04
26.00	.4099E+07	.6640E+06	.1659E+07	1.5355	.2487	46033.2	3555.2	15165.5	2385.4	10035.3	-.6384E-05	.2566E-04
27.00	.3773E+07	.6591E+06	.1736E+07	1.5379	.2686	43204.1	3872.3	13960.6	2368.6	10564.3	-.6708E-05	.2509E-04
28.00	.3463E+07	.6545E+06	.1812E+07	1.5321	.2896	40555.1	4207.9	12810.6	2353.3	11079.7	-.7012E-05	.2445E-04
29.00	.3170E+07	.6505E+06	.1885E+07	1.5188	.3117	38074.6	4562.9	11723.0	2340.1	11577.5	-.7288E-05	.2373E-04
30.00	.2896E+07	.6472E+06	.1956E+07	1.4985	.3349	35751.5	4938.4	10703.4	2329.4	12054.0	-.7528E-05	.2294E-04
31.00	.2641E+07	.6447E+06	.2024E+07	1.4721	.3594	33575.2	5335.3	9755.4	2321.8	12506.0	-.7721E-05	.2205E-04
32.00	.2406E+07	.6432E+06	.2091E+07	1.4403	.3851	31535.8	5754.8	8880.6	2317.8	12931.0	-.7855E-05	.2107E-04
33.00	.2190E+07	.6429E+06	.2151E+07	1.4040	.4121	29623.8	6198.1	8079.1	2318.1	13326.7	-.7917E-05	.1998E-04
34.00	.1995E+07	.6440E+06	.2209E+07	1.3639	.4404	27830.5	6666.4	7349.7	2323.6	13691.5	-.7894E-05	.1880E-04
35.00	.1817E+07	.6468E+06	.2263E+07	1.3208	.4701	26147.8	7161.3	6690.2	2335.1	14024.4	-.7770E-05	.1752E-04
36.00	.1658E+07	.6515E+06	.2312E+07	1.2754	.5011	24568.0	7684.2	6097.2	2353.7	14324.7	-.7533E-05	.1613E-04
37.00	.1516E+07	.6584E+06	.2357E+07	1.2284	.5336	23083.9	8236.7	5567.1	2380.3	14592.2	-.7167E-05	.1465E-04
38.00	.1389E+07	.6678E+06	.2397E+07	1.1803	.5676	21689.1	8820.6	5095.6	2416.5	14826.7	-.6661E-05	.1307E-04
39.00	.1276E+07	.6803E+06	.2433E+07	1.1315	.6030	20377.4	9437.7	4678.5	2463.4	15028.6	-.6005E-05	.1143E-04
40.00	.1176E+07	.6961E+06	.2463E+07	1.0826	.6399	19143.2	10090.3	4311.3	2522.8	15198.3	-.5190E-05	.9724E-05
41.00	.1091E+07	.7156E+06	.2488E+07	1.0339	.6784	17981.3	10780.3	3989.7	2596.5	15336.3	-.4216E-05	.7982E-05
42.00	.1015E+07	.7399E+06	.2507E+07	.9857	.7183	16886.8	11510.3	3709.3	2686.4	15443.0	-.3084E-05	.6227E-05
43.00	.9499E+06	.7691E+06	.2521E+07	.9382	.7596	15855.3	12282.8	3466.2	2794.9	15518.8	-.1801E-05	.4485E-05
44.00	.8934E+06	.8039E+06	.2529E+07	.8918	.8024	14882.7	13100.5	3256.7	2924.2	15564.2	-.3824E-06	.2784E-05
45.00	.8450E+06	.8451E+06	.2532E+07	.8464	.8465	13965.2	13966.6	3077.0	3077.3	15579.3	.1155E-05	.1152E-05

E GLASS/EPOXY -SPACEWIND-
FIBER COVERAGE RATIO = .250

FIBER PROPERTIES		RESIN PROPERTIES		COMPOSITE PROPERTIES
VF = .5000	EF = 1.050E+07	VR = .5000	ER = 4.700E+05	RHO= .0166
WF = .6907	EFT= 1.050E+07	WR = .3093	AR = 4.000E-05	FTU= 137500.0
RHOF= .0920	GF = 4.000E+05	RHOR= .0412	UR = .3500	FCU= 92500.0
FTU = 275000.0	AF = 2.800E-06	FSU = 8000.0		FSU= 8000.0
FCU = 185000.0	AFT= 2.800E-06			
UF = .2250				

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	1.371E+06	1.108E+05	6.578E+04	.2850	.0230	34375.0	.0	23125.0	1857.5	1300.3	4.394E-06	4.853E-05
1.00	1.370E+06	1.108E+05	6.613E+04	.2881	.0233	34320.5	2.0	23110.8	1857.8	1371.7	4.383E-06	4.851E-05
2.00	1.367E+06	1.109E+05	6.719E+04	.2974	.0241	34157.9	8.0	23067.9	1858.6	1448.4	4.350E-06	4.845E-05
3.00	1.363E+06	1.109E+05	6.896E+04	.3127	.0255	33889.9	18.1	22995.9	1859.9	1530.9	4.296E-06	4.835E-05
4.00	1.356E+06	1.111E+05	7.142E+04	.3340	.0274	33520.7	32.2	22893.7	1861.7	1619.5	4.221E-06	4.821E-05
5.00	1.347E+06	1.112E+05	7.456E+04	.3610	.0298	33056.3	50.4	22760.2	1864.1	1714.6	4.125E-06	4.803E-05
6.00	1.336E+06	1.114E+05	7.837E+04	.3934	.0328	32503.6	72.7	22594.0	1867.1	1816.8	4.008E-06	4.780E-05
7.00	1.323E+06	1.116E+05	8.282E+04	.4309	.0363	31870.8	99.1	22393.3	1870.7	1926.2	3.872E-06	4.754E-05
8.00	1.308E+06	1.118E+05	8.791E+04	.4730	.0404	31166.6	129.8	22156.6	1875.0	2043.3	3.716E-06	4.723E-05
9.00	1.290E+06	1.121E+05	9.359E+04	.5193	.0451	30400.4	164.7	21881.9	1879.9	2168.4	3.542E-06	4.688E-05
10.00	1.270E+06	1.124E+05	9.985E+04	.5691	.0504	29581.5	203.9	21567.9	1885.5	2301.8	3.351E-06	4.649E-05
11.00	1.248E+06	1.128E+05	1.067E+05	.6218	.0562	28719.5	247.4	21213.0	1891.9	2443.6	3.143E-06	4.606E-05
12.00	1.223E+06	1.132E+05	1.140E+05	.6766	.0626	27823.4	295.4	20816.5	1899.1	2594.0	2.921E-06	4.557E-05
13.00	1.196E+06	1.137E+05	1.218E+05	.7328	.0697	26901.9	348.0	20377.9	1907.3	2753.0	2.685E-06	4.505E-05
14.00	1.166E+06	1.142E+05	1.300E+05	.7894	.0773	25963.2	405.2	19897.5	1916.3	2920.7	2.437E-06	4.447E-05
15.00	1.134E+06	1.148E+05	1.386E+05	.8456	.0856	25014.7	467.1	19376.3	1926.5	3096.9	2.179E-06	4.385E-05
16.00	1.100E+06	1.154E+05	1.476E+05	.9005	.0945	24063.1	533.9	18816.2	1937.7	3281.3	1.914E-06	4.318E-05
17.00	1.064E+06	1.161E+05	1.569E+05	.9532	.1041	23114.5	605.6	18219.7	1950.2	3473.5	1.643E-06	4.246E-05
18.00	1.026E+06	1.169E+05	1.664E+05	1.0028	.1143	22174.1	682.5	17590.5	1964.1	3673.0	1.370E-06	4.169E-05
19.00	9.863E+05	1.178E+05	1.762E+05	1.0486	.1252	21246.3	764.6	16933.0	1979.4	3879.2	1.096E-06	4.086E-05
20.00	9.457E+05	1.188E+05	1.861E+05	1.0898	.1369	20334.9	852.1	16252.1	1996.3	4091.3	8.256E-07	3.999E-05
21.00	9.043E+05	1.199E+05	1.962E+05	1.1259	.1492	19443.1	945.2	15553.4	2015.0	4308.4	5.614E-07	3.907E-05
22.00	8.624E+05	1.211E+05	2.063E+05	1.1565	.1623	18573.3	1044.0	14843.0	2035.6	4529.5	3.074E-07	3.809E-05
23.00	8.203E+05	1.224E+05	2.165E+05	1.1812	.1762	17727.5	1148.7	14126.8	2058.3	4753.3	6.756E-08	3.706E-05
24.00	7.784E+05	1.238E+05	2.266E+05	1.1998	.1908	16907.3	1259.6	13411.1	2083.4	4978.8	-1.541E-07	3.598E-05
25.00	7.370E+05	1.254E+05	2.367E+05	1.2124	.2063	16113.6	1376.8	12701.6	2110.9	5204.4	-3.530E-07	3.486E-05
26.00	6.964E+05	1.272E+05	2.467E+05	1.2189	.2226	15347.2	1500.5	12003.8	2141.2	5428.9	-5.243E-07	3.368E-05
27.00	6.569E+05	1.291E+05	2.564E+05	1.2196	.2397	14608.4	1631.1	11322.7	2174.6	5650.9	-6.631E-07	3.245E-05
28.00	6.186E+05	1.312E+05	2.660E+05	1.2148	.2575	13897.4	1768.8	10662.5	2211.3	5868.8	-7.644E-07	3.118E-05
29.00	5.819E+05	1.335E+05	2.753E+05	1.2048	.2765	13214.0	1913.8	10026.9	2251.7	6081.4	-8.228E-07	2.987E-05
30.00	5.468E+05	1.361E+05	2.842E+05	1.1902	.2963	12557.9	2066.4	9418.6	2296.2	6287.1	-8.331E-07	2.852E-05
31.00	5.134E+05	1.389E+05	2.929E+05	1.1713	.3170	11928.8	2227.0	8839.9	2345.1	6484.8	-7.899E-07	2.714E-05
32.00	4.819E+05	1.421E+05	3.011E+05	1.1487	.3387	11325.9	2395.9	8292.2	2398.7	6673.3	-6.881E-07	2.572E-05
33.00	4.522E+05	1.455E+05	3.089E+05	1.1229	.3613	10748.8	2573.4	7776.3	2457.8	6851.3	-5.226E-07	2.428E-05
34.00	4.243E+05	1.492E+05	3.162E+05	1.0944	.3849	10196.5	2759.9	7292.4	2522.7	7018.0	-2.887E-07	2.282E-05
35.00	3.983E+05	1.534E+05	3.230E+05	1.0635	.4096	9668.4	2955.8	6840.4	2594.1	7172.4	1.797E-08	2.135E-05
36.00	3.741E+05	1.579E+05	3.293E+05	1.0309	.4352	9163.7	3161.5	6419.6	2672.6	7313.8	4.013E-07	1.987E-05
37.00	3.516E+05	1.629E+05	3.349E+05	.9968	.4619	8681.4	3377.4	6029.2	2758.8	7441.5	8.645E-07	1.839E-05
38.00	3.308E+05	1.684E+05	3.400E+05	.9617	.4895	8220.8	3604.1	5667.9	2853.5	7555.2	1.410E-06	1.692E-05
39.00	3.116E+05	1.744E+05	3.445E+05	.9259	.5183	7781.1	3841.9	5334.5	2957.5	7654.3	2.041E-06	1.547E-05
40.00	2.939E+05	1.810E+05	3.483E+05	.8897	.5480	7361.2	4091.4	5027.4	3071.8	7738.6	2.754E-06	1.404E-05
41.00	2.777E+05	1.883E+05	3.514E+05	.8533	.5787	6960.6	4353.1	4745.1	3197.3	7807.8	3.554E-06	1.265E-05
42.00	2.627E+05	1.963E+05	3.539E+05	.8171	.6104	6578.3	4627.6	4486.1	3335.0	7861.7	4.437E-06	1.129E-05
43.00	2.490E+05	2.050E+05	3.557E+05	.7811	.6433	6213.5	4915.6	4248.7	3486.0	7900.4	5.401E-06	9.991E-06
44.00	2.365E+05	2.146E+05	3.567E+05	.7456	.6764	5865.5	5217.5	4031.4	3651.6	7923.5	6.443E-06	8.743E-06
45.00	2.250E+05	2.250E+05	3.571E+05	.7106	.7107	5533.6	5534.1	3832.8	3833.1	7931.3	7.560E-06	7.559E-06

E GLASS/EPOXY -SPACEWIND-
FIBER COVERAGE RATIO = .375

FIBER PROPERTIES

VF = .5000
WF = .6907
RHOF= .0920
FTU = 275000.0
FCU = 185000.0
UF = .2200
EF = 1.050E+07
EFT= 1.050E+07
GF = 4.000E+05
AF = 2.800E-06
AFT= 2.800E-06

RESIN PROPERTIES

VR = .5000
WR = .3093
RHOR= .0412
FSU = 8000.0
ER = 4.700E+05
AR = 4.000E-05
UR = .3500

COMPOSITE PROPERTIES

RHO= .0250
FTU= 137500.0
FCU= 92500.0
FSU= 8000.0

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	2.057E+06	2.493E+05	9.866E+04	.2850	.0345	51562.5	.0	34687.5	4168.4	1967.7	4.394E-06	3.235E-05
1.00	2.055E+06	2.493E+05	9.921E+04	.2872	.0348	51480.8	3.0	34666.3	4167.9	2070.8	4.387E-06	3.234E-05
2.00	2.051E+06	2.492E+05	1.008E+05	.2936	.0357	51236.9	12.1	34602.4	4166.6	2183.6	4.366E-06	3.233E-05
3.00	2.044E+06	2.491E+05	1.036E+05	.3043	.0371	50834.8	27.2	34495.4	4164.5	2306.3	4.332E-06	3.232E-05
4.00	2.034E+06	2.489E+05	1.073E+05	.3192	.0391	50281.1	48.3	34344.4	4161.5	2439.5	4.284E-06	3.226E-05
5.00	2.021E+06	2.486E+05	1.122E+05	.3381	.0416	49584.5	75.6	34148.0	4157.7	2583.9	4.222E-06	3.220E-05
6.00	2.005E+06	2.483E+05	1.180E+05	.3610	.0447	48755.4	109.1	33904.8	4153.1	2740.1	4.147E-06	3.213E-05
7.00	1.986E+06	2.480E+05	1.249E+05	.3877	.0484	47806.2	148.7	33613.2	4147.7	2908.6	4.059E-06	3.205E-05
8.00	1.964E+06	2.476E+05	1.327E+05	.4179	.0527	46749.9	194.7	33271.2	4141.7	3089.9	3.958E-06	3.196E-05
9.00	1.938E+06	2.471E+05	1.414E+05	.4514	.0576	45600.6	247.0	32877.1	4135.0	3284.3	3.843E-06	3.185E-05
10.00	1.909E+06	2.467E+05	1.510E+05	.4878	.0630	44372.3	305.8	32429.1	4127.8	3492.1	3.717E-06	3.172E-05
11.00	1.877E+06	2.461E+05	1.615E+05	.5269	.0691	43079.2	371.1	31925.4	4120.0	3713.3	3.578E-06	3.158E-05
12.00	1.841E+06	2.456E+05	1.727E+05	.5682	.0758	41735.1	443.2	31364.9	4111.8	3947.8	3.427E-06	3.142E-05
13.00	1.802E+06	2.450E+05	1.847E+05	.6113	.0831	40352.8	522.0	30746.7	4103.4	4195.6	3.265E-06	3.124E-05
14.00	1.760E+06	2.444E+05	1.973E+05	.6557	.0911	38944.7	607.8	30070.6	4094.7	4456.1	3.093E-06	3.104E-05
15.00	1.714E+06	2.439E+05	2.106E+05	.7007	.0997	37522.0	700.7	29337.2	4086.0	4728.8	2.911E-06	3.081E-05
16.00	1.666E+06	2.433E+05	2.244E+05	.7459	.1089	36094.7	800.8	28547.8	4077.4	5013.1	2.721E-06	3.057E-05
17.00	1.614E+06	2.427E+05	2.387E+05	.7906	.1189	34671.8	908.5	27704.8	4069.0	5308.1	2.522E-06	3.029E-05
18.00	1.559E+06	2.421E+05	2.534E+05	.8343	.1295	33261.2	1023.8	26811.6	4061.0	5612.7	2.318E-06	2.999E-05
19.00	1.503E+06	2.416E+05	2.684E+05	.8762	.1409	31869.5	1146.9	25872.7	4053.7	5925.8	2.109E-06	2.966E-05
20.00	1.444E+06	2.411E+05	2.837E+05	.9158	.1529	30502.4	1278.2	24893.6	4047.2	6246.1	1.897E-06	2.930E-05
21.00	1.383E+06	2.407E+05	2.991E+05	.9526	.1658	29164.7	1417.8	23880.8	4041.8	6572.0	1.684E-06	2.891E-05
22.00	1.321E+06	2.403E+05	3.147E+05	.9859	.1793	27860.0	1566.0	22841.5	4037.9	6902.2	1.473E-06	2.848E-05
23.00	1.259E+06	2.401E+05	3.303E+05	1.0154	.1937	26591.3	1723.1	21783.8	4035.7	7234.8	1.267E-06	2.801E-05
24.00	1.196E+06	2.399E+05	3.459E+05	1.0407	.2088	25360.9	1889.3	20715.9	4035.6	7568.1	1.068E-06	2.750E-05
25.00	1.133E+06	2.399E+05	3.614E+05	1.0615	.2247	24170.4	2065.1	19646.6	4036.0	7900.4	8.805E-07	2.694E-05
26.00	1.072E+06	2.401E+05	3.767E+05	1.0776	.2415	23020.8	2250.8	18584.4	4043.3	8229.8	7.083E-07	2.634E-05
27.00	1.011E+06	2.405E+05	3.917E+05	1.0889	.2591	21912.6	2446.7	17537.4	4052.1	8554.5	5.558E-07	2.569E-05
28.00	9.515E+05	2.411E+05	4.064E+05	1.0954	.2775	20846.1	2653.2	16513.4	4064.8	8872.7	4.280E-07	2.499E-05
29.00	8.942E+05	2.420E+05	4.207E+05	1.0972	.2969	19821.0	2870.7	15519.3	4082.2	9182.5	3.302E-07	2.424E-05
30.00	8.391E+05	2.431E+05	4.345E+05	1.0945	.3171	18836.9	3099.7	14561.2	4104.8	9482.1	2.682E-07	2.344E-05
31.00	7.864E+05	2.447E+05	4.477E+05	1.0874	.3383	17893.2	3340.6	13644.2	4133.5	9770.1	2.480E-07	2.258E-05
32.00	7.365E+05	2.466E+05	4.604E+05	1.0763	.3603	16988.9	3593.9	12772.4	4169.1	10044.6	2.760E-07	2.168E-05
33.00	6.893E+05	2.489E+05	4.723E+05	1.0614	.3833	16123.2	3860.1	11948.8	4212.4	10304.3	3.586E-07	2.072E-05
34.00	6.451E+05	2.518E+05	4.836E+05	1.0432	.4072	15294.8	4139.9	11175.5	4264.6	10547.9	5.022E-07	1.971E-05
35.00	6.039E+05	2.552E+05	4.940E+05	1.0221	.4320	14502.7	4433.7	10453.4	4326.7	10774.0	7.130E-07	1.866E-05
36.00	5.657E+05	2.593E+05	5.037E+05	.9984	.4577	13745.5	4742.3	9782.9	4399.9	10981.6	9.967E-07	1.756E-05
37.00	5.303E+05	2.641E+05	5.124E+05	.9724	.4843	13022.2	5066.2	9163.3	4485.7	11169.8	1.358E-06	1.643E-05
38.00	4.979E+05	2.698E+05	5.202E+05	.9446	.5118	12331.3	5406.1	8593.7	4585.5	11337.6	1.802E-06	1.527E-05
39.00	4.681E+05	2.763E+05	5.271E+05	.9153	.5402	11671.6	5762.8	8072.4	4700.9	11484.4	2.331E-06	1.410E-05
40.00	4.411E+05	2.838E+05	5.329E+05	.8849	.5693	11041.9	6137.0	7597.2	4833.6	11609.5	2.946E-06	1.291E-05
41.00	4.165E+05	2.924E+05	5.377E+05	.8535	.5992	10440.9	6529.6	7166.0	4985.7	11712.5	3.647E-06	1.173E-05
42.00	3.943E+05	3.022E+05	5.415E+05	.8216	.6298	9867.4	6941.4	6776.2	5159.0	11793.0	4.432E-06	1.056E-05
43.00	3.743E+05	3.134E+05	5.442E+05	.7894	.6610	9320.2	7373.3	6425.2	5355.8	11850.7	5.297E-06	9.413E-06
44.00	3.564E+05	3.261E+05	5.459E+05	.7570	.6927	8798.3	7826.2	6110.3	5578.3	11885.3	6.236E-06	8.303E-06
45.00	3.403E+05	3.404E+05	5.464E+05	.7247	.7247	8300.4	8301.1	5828.7	5829.2	11896.9	7.242E-06	7.240E-06

E GLASS/EPOXY -SPACEWIND-
FIBER COVERAGE RATIO = .500

FIBER PROPERTIES		RESIN PROPERTIES		COMPOSITE PROPERTIES
VF = .5000	EF = 1.050E+07	VR = .5000	ER = 4.700E+05	RHO= .0333
WF = .6907	EFT= 1.050E+07	WR = .3093	AR = 4.000E-05	FTU= 137500.0
RHOF= .0920	GF = 4.000E+05	RHOR= .0412	UR = .3500	FCU= 92500.0
FTU = 275000.0	AF = 2.800E-06	FSU = 8000.0		FSU= 8000.0
FCU = 185000.0	AFT= 2.800E-06			
UF = .2200				

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	2.742E+06	4.433E+05	1.316E+05	.2850	.0461	68750.0	.0	46250.0	7392.6	2644.2	4.394E-06	2.426E-05
1.00	2.741E+06	4.432E+05	1.323E+05	.2867	.0464	68641.0	4.0	46221.9	7391.1	2778.6	4.389E-06	2.426E-05
2.00	2.735E+06	4.428E+05	1.345E+05	.2917	.0472	68315.8	16.1	46137.3	7386.0	2926.4	4.374E-06	2.426E-05
3.00	2.726E+06	4.423E+05	1.382E+05	.3001	.0487	67779.8	36.2	45995.7	7377.6	3088.7	4.350E-06	2.425E-05
4.00	2.712E+06	4.416E+05	1.434E+05	.3117	.0507	67041.5	64.4	45796.2	7365.9	3266.6	4.316E-06	2.423E-05
5.00	2.695E+06	4.406E+05	1.500E+05	.3266	.0534	66112.6	100.8	45537.7	7350.8	3461.0	4.272E-06	2.422E-05
6.00	2.674E+06	4.394E+05	1.580E+05	.3446	.0566	65007.3	145.4	45218.5	7332.5	3672.7	4.218E-06	2.420E-05
7.00	2.649E+06	4.381E+05	1.673E+05	.3656	.0605	63741.6	198.3	44836.9	7311.0	3902.2	4.154E-06	2.417E-05
8.00	2.619E+06	4.365E+05	1.780E+05	.3896	.0649	62333.3	259.6	44391.2	7286.3	4150.1	4.081E-06	2.414E-05
9.00	2.586E+06	4.347E+05	1.899E+05	.4163	.0700	60800.8	329.3	43879.3	7258.6	4416.4	3.999E-06	2.410E-05
10.00	2.548E+06	4.326E+05	2.031E+05	.4455	.0757	59163.1	407.7	43299.4	7227.9	4701.3	3.906E-06	2.406E-05
11.00	2.506E+06	4.306E+05	2.174E+05	.4771	.0820	57439.0	494.8	42649.7	7194.3	5004.6	3.805E-06	2.401E-05
12.00	2.460E+06	4.283E+05	2.327E+05	.5107	.0889	55646.7	590.9	41926.7	7157.9	5325.7	3.694E-06	2.395E-05
13.00	2.409E+06	4.258E+05	2.491E+05	.5461	.0965	53803.8	696.0	41135.5	7118.9	5664.2	3.574E-06	2.388E-05
14.00	2.355E+06	4.232E+05	2.663E+05	.5830	.1048	51926.3	810.4	40269.4	7077.5	6019.2	3.446E-06	2.381E-05
15.00	2.296E+06	4.204E+05	2.844E+05	.6209	.1137	50029.3	934.2	39330.7	7033.7	6389.7	3.309E-06	2.372E-05
16.00	2.233E+06	4.175E+05	3.033E+05	.6595	.1233	48126.3	1067.8	38320.6	6987.9	6774.4	3.164E-06	2.362E-05
17.00	2.166E+06	4.144E+05	3.228E+05	.6983	.1336	46229.1	1211.3	37241.1	6940.2	7172.1	3.013E-06	2.351E-05
18.00	2.095E+06	4.113E+05	3.428E+05	.7369	.1447	44348.2	1365.0	36095.5	6891.0	7581.2	2.854E-06	2.338E-05
19.00	2.021E+06	4.081E+05	3.633E+05	.7748	.1564	42492.6	1529.2	34888.2	6840.5	8000.1	2.691E-06	2.324E-05
20.00	1.945E+06	4.048E+05	3.842E+05	.8116	.1689	40669.9	1704.2	33624.9	6789.1	8426.9	2.521E-06	2.307E-05
21.00	1.866E+06	4.014E+05	4.053E+05	.8466	.1821	38886.2	1890.3	32312.5	6737.1	8859.9	2.349E-06	2.289E-05
22.00	1.785E+06	3.980E+05	4.266E+05	.8795	.1961	37146.6	2087.9	30959.1	6685.0	9296.9	2.176E-06	2.268E-05
23.00	1.702E+06	3.947E+05	4.480E+05	.9099	.2109	35455.1	2297.4	29573.8	6633.3	9735.9	2.003E-06	2.245E-05
24.00	1.619E+06	3.914E+05	4.693E+05	.9372	.2265	33814.6	2519.1	28166.6	6582.6	10174.8	1.832E-06	2.219E-05
25.00	1.536E+06	3.882E+05	4.904E+05	.9613	.2429	32227.2	2753.5	26748.1	6533.5	10611.4	1.667E-06	2.189E-05
26.00	1.453E+06	3.851E+05	5.113E+05	.9817	.2602	30694.4	3001.1	25329.2	6486.7	11043.5	1.511E-06	2.156E-05
27.00	1.371E+06	3.822E+05	5.318E+05	.9983	.2782	29216.8	3262.2	23921.0	6442.9	11468.9	1.366E-06	2.119E-05
28.00	1.291E+06	3.795E+05	5.518E+05	1.0109	.2971	27794.8	3537.6	22534.3	6403.1	11885.4	1.238E-06	2.078E-05
29.00	1.213E+06	3.771E+05	5.713E+05	1.0194	.3169	26428.0	3827.6	21179.2	6368.3	12290.8	1.131E-06	2.033E-05
30.00	1.137E+06	3.750E+05	5.902E+05	1.0238	.3375	25115.9	4132.9	19865.3	6339.6	12683.0	1.050E-06	1.983E-05
31.00	1.065E+06	3.734E+05	6.083E+05	1.0241	.3590	23857.6	4454.1	18600.8	6318.1	13060.0	1.002E-06	1.927E-05
32.00	9.963E+05	3.722E+05	6.255E+05	1.0206	.3814	22651.9	4791.8	17393.1	6305.4	13419.7	9.926E-07	1.867E-05
33.00	9.307E+05	3.717E+05	6.419E+05	1.0133	.4046	21497.5	5146.8	16248.0	6302.8	13760.3	1.028E-06	1.801E-05
34.00	8.694E+05	3.718E+05	6.572E+05	1.0025	.4287	20393.1	5519.9	15170.0	6312.2	14080.2	1.117E-06	1.729E-05
35.00	8.122E+05	3.727E+05	6.715E+05	.9885	.4535	19336.9	5911.6	14162.4	6335.3	14377.5	1.265E-06	1.652E-05
36.00	7.592E+05	3.745E+05	6.846E+05	.9716	.4793	18327.4	6323.0	13226.9	6374.2	14650.9	1.479E-06	1.569E-05
37.00	7.103E+05	3.774E+05	6.966E+05	.9520	.5058	17362.9	6754.9	12364.2	6431.1	14899.1	1.767E-06	1.481E-05
38.00	6.656E+05	3.815E+05	7.072E+05	.9301	.5330	16441.7	7208.1	11574.0	6508.6	15120.8	2.132E-06	1.389E-05
39.00	6.250E+05	3.869E+05	7.166E+05	.9062	.5609	15562.1	7683.7	10854.9	6609.3	15315.0	2.581E-06	1.293E-05
40.00	5.883E+05	3.937E+05	7.246E+05	.8807	.5894	14722.5	8182.7	10204.6	6736.6	15480.8	3.112E-06	1.193E-05
41.00	5.553E+05	4.023E+05	7.312E+05	.8537	.6185	13921.2	8706.2	9620.6	6891.9	15617.4	3.729E-06	1.092E-05
42.00	5.260E+05	4.127E+05	7.364E+05	.8257	.6479	13156.5	9255.3	9099.3	7080.2	15724.3	4.428E-06	9.907E-06
43.00	4.999E+05	4.252E+05	7.401E+05	.7968	.6777	12427.0	9831.1	8637.4	7304.6	15801.0	5.204E-06	8.897E-06
44.00	4.771E+05	4.400E+05	7.423E+05	.7674	.7076	11731.0	10435.0	8230.9	7568.7	15847.2	6.056E-06	7.908E-06
45.00	4.572E+05	4.572E+05	7.430E+05	.7376	.7376	11067.1	11068.2	7875.8	7876.4	15862.5	6.956E-06	6.954E-06

E GLASS/EPOXY -SPACEWIND-
FIBER COVERAGE RATIO = .625

FIBER PROPERTIES

VF = .5000 EF = 1.050E+07
MF = .6907 EFT= 1.050E+07
RHOF= .0920 GF = 4.000E+05
FTU = 275000.0 AF = 2.800E-06
FCU = 185000.0 AFT= 2.800E-06
UF = .2200

RESIN PROPERTIES

VR = .5000 ER = 4.700E+05
MR = .3093 AR = 4.000E-05
RHOR= .0412 UR = .3500
FSU = 8000.0

COMPOSITE PROPERTIES

RHO= .0416
FTU= 137500.0
FCU= 92500.0
FSU= 8000.0

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	3.428E+06	6.926E+05	1.644E+05	.2850	.0576	85937.5	.0	57812.5	11526.6	3331.5	4.394E-06	1.941E-05
1.00	3.426E+06	6.924E+05	1.654E+05	.2864	.0579	85801.3	5.0	57777.5	11523.1	3494.9	4.396E-06	1.941E-05
2.00	3.419E+06	6.917E+05	1.682E+05	.2906	.0588	85394.8	20.1	57672.4	11512.6	3676.6	4.379E-06	1.941E-05
3.00	3.407E+06	6.906E+05	1.730E+05	.2975	.0603	84724.7	45.3	57496.7	11495.1	3878.1	4.361E-06	1.941E-05
4.00	3.390E+06	6.890E+05	1.796E+05	.3072	.0624	83801.9	80.6	57249.4	11470.8	4100.9	4.335E-06	1.941E-05
5.00	3.369E+06	6.871E+05	1.880E+05	.3196	.0652	82640.8	126.0	56929.3	11439.4	4346.0	4.301E-06	1.940E-05
6.00	3.343E+06	6.846E+05	1.983E+05	.3347	.0685	81259.1	181.8	56534.9	11401.3	4614.3	4.260E-06	1.940E-05
7.00	3.311E+06	6.818E+05	2.102E+05	.3523	.0725	79677.0	247.9	56064.5	11356.3	4906.3	4.212E-06	1.939E-05
8.00	3.275E+06	6.785E+05	2.239E+05	.3724	.0771	77916.6	324.5	55516.2	11304.6	5222.5	4.157E-06	1.939E-05
9.00	3.234E+06	6.748E+05	2.392E+05	.3949	.0824	76001.0	411.7	54888.0	11246.3	5562.6	4.093E-06	1.938E-05
10.00	3.187E+06	6.707E+05	2.560E+05	.4196	.0883	73953.9	509.6	54178.0	11181.5	5926.5	4.023E-06	1.937E-05
11.00	3.136E+06	6.661E+05	2.743E+05	.4464	.0948	71798.7	618.5	53384.3	11110.2	6313.4	3.945E-06	1.935E-05
12.00	3.079E+06	6.612E+05	2.939E+05	.4751	.1020	69558.4	738.6	52505.3	11032.7	6722.6	3.859E-06	1.934E-05
13.00	3.017E+06	6.559E+05	3.148E+05	.5055	.1099	67254.7	870.0	51539.8	10949.1	7152.9	3.766E-06	1.932E-05
14.00	2.950E+06	6.502E+05	3.369E+05	.5374	.1185	64907.9	1013.0	50487.3	10859.7	7603.0	3.666E-06	1.929E-05
15.00	2.877E+06	6.442E+05	3.601E+05	.5704	.1277	62536.7	1157.8	49347.7	10764.6	8071.5	3.559E-06	1.926E-05
16.00	2.800E+06	6.378E+05	3.842E+05	.6044	.1377	60157.8	1334.7	48121.9	10664.2	8556.6	3.446E-06	1.923E-05
17.00	2.718E+06	6.311E+05	4.092E+05	.6389	.1483	57786.4	1514.1	46811.9	10558.7	9056.5	3.325E-06	1.919E-05
18.00	2.632E+06	6.241E+05	4.348E+05	.6736	.1597	55435.3	1706.3	45420.8	10448.5	9569.2	3.199E-06	1.913E-05
19.00	2.542E+06	6.168E+05	4.611E+05	.7081	.1719	53115.8	1911.5	43952.9	10334.1	10092.7	3.067E-06	1.907E-05
20.00	2.448E+06	6.093E+05	4.878E+05	.7421	.1847	50837.4	2130.3	42414.1	10215.9	10624.8	2.930E-06	1.900E-05
21.00	2.351E+06	6.016E+05	5.148E+05	.7751	.1984	48607.8	2352.9	40811.5	10094.5	11163.2	2.789E-06	1.891E-05
22.00	2.251E+06	5.937E+05	5.421E+05	.8068	.2128	46433.3	2609.9	39153.7	9970.4	11705.6	2.646E-06	1.881E-05
23.00	2.149E+06	5.857E+05	5.694E+05	.8367	.2280	44318.9	2871.8	37450.6	9844.4	12249.5	2.501E-06	1.869E-05
24.00	2.046E+06	5.776E+05	5.966E+05	.8645	.2441	42268.2	3148.9	35713.5	9717.3	12792.5	2.356E-06	1.855E-05
25.00	1.942E+06	5.695E+05	6.237E+05	.8898	.2609	40284.0	3441.9	33954.3	9590.0	13332.0	2.213E-06	1.839E-05
26.00	1.838E+06	5.614E+05	6.504E+05	.9123	.2786	38368.4	3751.3	32186.2	9463.6	13865.5	2.075E-06	1.820E-05
27.00	1.736E+06	5.534E+05	6.767E+05	.9317	.2971	36521.3	4077.8	30422.3	9339.1	14390.4	1.944E-06	1.799E-05
28.00	1.634E+06	5.456E+05	7.023E+05	.9478	.3164	34743.4	4422.0	28676.3	9218.0	14904.2	1.824E-06	1.774E-05
29.00	1.536E+06	5.381E+05	7.273E+05	.9604	.3365	33035.0	4784.5	26961.4	9101.6	15404.3	1.720E-06	1.745E-05
30.00	1.440E+06	5.309E+05	7.514E+05	.9694	.3575	31394.8	5166.1	25290.1	8991.7	15888.2	1.635E-06	1.713E-05
31.00	1.347E+06	5.242E+05	7.746E+05	.9747	.3793	29821.9	5567.6	23674.3	8890.1	16353.5	1.575E-06	1.676E-05
32.00	1.259E+06	5.182E+05	7.966E+05	.9765	.4020	28314.9	5989.8	22124.4	8798.8	16797.7	1.546E-06	1.635E-05
33.00	1.175E+06	5.128E+05	8.176E+05	.9746	.4254	26871.9	6433.6	20649.6	8720.2	17218.8	1.555E-06	1.588E-05
34.00	1.096E+06	5.084E+05	8.372E+05	.9694	.4496	25491.3	6899.8	19257.4	8656.8	17614.4	1.608E-06	1.536E-05
35.00	1.022E+06	5.053E+05	8.555E+05	.9608	.4745	24171.1	7389.5	17953.6	8611.4	17982.6	1.714E-06	1.479E-05
36.00	9.542E+05	5.028E+05	8.723E+05	.9492	.5001	22909.2	7903.8	16742.4	8587.0	18321.5	1.879E-06	1.414E-05
37.00	8.914E+05	5.012E+05	8.876E+05	.9347	.5264	21703.6	8443.6	15626.3	8587.2	18629.4	2.110E-06	1.345E-05
38.00	8.340E+05	5.029E+05	9.012E+05	.9177	.5533	20552.1	9010.1	14606.0	8615.5	18904.8	2.414E-06	1.271E-05
39.00	7.821E+05	5.056E+05	9.132E+05	.8983	.5807	19452.7	9604.7	13681.2	8676.0	19146.2	2.796E-06	1.191E-05
40.00	7.356E+05	5.104E+05	9.234E+05	.8770	.6085	18403.1	10228.4	12850.1	8772.9	19352.5	3.258E-06	1.108E-05
41.00	6.942E+05	5.175E+05	9.319E+05	.8539	.6366	17401.5	10882.7	12109.8	8910.9	19522.7	3.802E-06	1.021E-05
42.00	6.577E+05	5.273E+05	9.385E+05	.8293	.6649	16445.6	11569.1	11456.5	9094.8	19655.9	4.424E-06	9.325E-06
43.00	6.259E+05	5.400E+05	9.432E+05	.8035	.6932	15533.7	12288.9	10886.3	9329.7	19751.5	5.121E-06	8.434E-06
44.00	5.986E+05	5.559E+05	9.461E+05	.7768	.7214	14663.8	13043.7	10393.4	9621.0	19809.3	5.882E-06	7.552E-06
45.00	5.753E+05	5.753E+05	9.470E+05	.7493	.7494	13833.9	13835.2	9973.3	9973.9	19828.2	6.698E-06	6.696E-06

E GLASS/EPOXY -SPACEWIND-
FIBER COVERAGE RATIO = .750

FIBER PROPERTIES		RESIN PROPERTIES		COMPOSITE PROPERTIES
VF = .5000	EF = 1.050E+07	VR = .5000	ER = 4.780E+05	RHO= .0499
WF = .6907	EFT= 1.050E+07	WR = .3093	AR = 4.000E-05	FTU= 137500.0
RHOF= .0920	GF = 4.000E+05	RHOR= .0412	UR = .3500	FCU= 92500.0
FTU = 275000.0	AF = 2.800E-06	FSU = 8000.0		FSU= 8000.0
FCU = 185000.0	AFT= 2.800E-06			
UF = .2200				

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	4.114E+06	9.973E+05	1.973E+05	.2850	.0691	103125.0	.0	69375.0	16567.1	4028.6	4.394E-06	1.619E-05
1.00	4.111E+06	9.970E+05	1.985E+05	.2862	.0694	102961.5	6.0	69333.3	16561.3	4219.7	4.391E-06	1.618E-05
2.00	4.102E+06	9.958E+05	2.020E+05	.2898	.0704	102473.7	24.1	69207.9	16543.7	4434.4	4.382E-06	1.618E-05
3.00	4.088E+06	9.940E+05	2.078E+05	.2958	.0719	101669.6	54.3	68998.4	16514.4	4674.8	4.368E-06	1.618E-05
4.00	4.069E+06	9.913E+05	2.159E+05	.3042	.0741	100562.2	96.7	68703.8	16473.4	4942.5	4.347E-06	1.619E-05
5.00	4.043E+06	9.880E+05	2.263E+05	.3150	.0770	99168.9	151.2	68322.9	16420.8	5238.9	4.321E-06	1.618E-05
6.00	4.011E+06	9.839E+05	2.389E+05	.3283	.0805	97510.9	218.1	67854.1	16356.6	5564.7	4.289E-06	1.619E-05
7.00	3.974E+06	9.790E+05	2.536E+05	.3433	.0845	95612.4	297.4	67295.9	16280.9	5920.5	4.251E-06	1.619E-05
8.00	3.931E+06	9.735E+05	2.704E+05	.3608	.0894	93499.9	389.4	66646.2	16193.7	6306.2	4.207E-06	1.619E-05
9.00	3.882E+06	9.672E+05	2.891E+05	.3804	.0948	91201.2	494.0	65903.0	16095.2	6721.4	4.157E-06	1.620E-05
10.00	3.826E+06	9.602E+05	3.098E+05	.4021	.1009	88744.6	611.6	65064.4	15985.5	7165.5	4.101E-06	1.620E-05
11.00	3.765E+06	9.525E+05	3.322E+05	.4256	.1077	86158.5	742.2	64128.5	15864.7	7637.2	4.039E-06	1.620E-05
12.00	3.698E+06	9.441E+05	3.563E+05	.4509	.1151	83470.1	886.3	63093.6	15733.1	8135.2	3.971E-06	1.621E-05
13.00	3.624E+06	9.350E+05	3.820E+05	.4777	.1233	80705.6	1044.0	61958.4	15590.8	8657.8	3.897E-06	1.621E-05
14.00	3.545E+06	9.253E+05	4.092E+05	.5060	.1321	77889.5	1215.6	60722.1	15438.0	9203.4	3.817E-06	1.621E-05
15.00	3.459E+06	9.149E+05	4.376E+05	.5356	.1417	75044.0	1401.3	59384.7	15275.2	9769.7	3.731E-06	1.622E-05
16.00	3.368E+06	9.039E+05	4.672E+05	.5661	.1519	72189.4	1601.7	57947.0	15102.5	10354.8	3.639E-06	1.619E-05
17.00	3.271E+06	8.924E+05	4.979E+05	.5973	.1629	69343.6	1816.9	56410.8	14920.5	10956.3	3.542E-06	1.618E-05
18.00	3.169E+06	8.802E+05	5.294E+05	.6290	.1747	66522.3	2047.5	54779.0	14729.6	11571.9	3.439E-06	1.617E-05
19.00	3.063E+06	8.675E+05	5.616E+05	.6609	.1872	63739.0	2293.8	53056.1	14530.3	12199.1	3.331E-06	1.615E-05
20.00	2.952E+06	8.544E+05	5.945E+05	.6925	.2005	61004.8	2556.3	51247.8	14323.3	12835.4	3.219E-06	1.612E-05
21.00	2.837E+06	8.408E+05	6.277E+05	.7237	.2145	58329.3	2835.5	49361.5	14109.2	13478.2	3.102E-06	1.608E-05
22.00	2.718E+06	8.268E+05	6.611E+05	.7540	.2294	55719.9	3131.9	47406.3	13889.0	14124.8	2.982E-06	1.604E-05
23.00	2.597E+06	8.125E+05	6.947E+05	.7831	.2450	53182.6	3446.1	45392.7	13663.6	14772.5	2.861E-06	1.598E-05
24.00	2.474E+06	7.979E+05	7.281E+05	.8106	.2614	50721.9	3778.7	43332.7	13434.1	15418.5	2.736E-06	1.591E-05
25.00	2.350E+06	7.832E+05	7.614E+05	.8363	.2787	48340.8	4130.3	41239.8	13201.7	16059.9	2.613E-06	1.582E-05
26.00	2.226E+06	7.683E+05	7.942E+05	.8597	.2967	46041.5	4501.6	39128.5	12967.9	16693.9	2.493E-06	1.571E-05
27.00	2.103E+06	7.535E+05	8.264E+05	.8807	.3156	43825.2	4893.4	37014.1	12734.3	17317.5	2.377E-06	1.559E-05
28.00	1.981E+06	7.387E+05	8.579E+05	.8989	.3353	41692.1	5306.3	34912.6	12502.7	17927.8	2.268E-06	1.543E-05
29.00	1.861E+06	7.243E+05	8.886E+05	.9142	.3558	39642.0	5741.4	32840.0	12275.2	18521.9	2.171E-06	1.525E-05
30.00	1.744E+06	7.101E+05	9.182E+05	.9263	.3771	37673.8	6199.3	30811.8	12054.1	19096.9	2.086E-06	1.504E-05
31.00	1.632E+06	6.966E+05	9.466E+05	.9351	.3991	35786.3	6681.1	28843.1	11842.1	19650.0	2.025E-06	1.479E-05
32.00	1.524E+06	6.837E+05	9.738E+05	.9407	.4220	33977.8	7187.7	26947.8	11642.0	20178.5	1.987E-06	1.450E-05
33.00	1.422E+06	6.717E+05	9.995E+05	.9429	.4455	32246.3	7720.3	25138.3	11457.1	20679.5	1.979E-06	1.416E-05
34.00	1.325E+06	6.608E+05	1.024E+06	.9418	.4698	30589.6	8279.8	23425.5	11291.1	21150.6	2.016E-06	1.377E-05
35.00	1.234E+06	6.513E+05	1.046E+06	.9375	.4947	29005.3	8867.5	21818.2	11147.8	21589.3	2.086E-06	1.334E-05
36.00	1.150E+06	6.433E+05	1.067E+06	.9302	.5202	27491.1	9484.5	20323.3	11031.6	21993.4	2.214E-06	1.284E-05
37.00	1.073E+06	6.372E+05	1.085E+06	.9199	.5462	26044.3	10132.3	18945.6	10947.3	22360.8	2.402E-06	1.229E-05
38.00	1.003E+06	6.332E+05	1.102E+06	.9069	.5727	24662.5	10812.2	17687.9	10900.2	22689.6	2.657E-06	1.169E-05
39.00	9.395E+05	6.318E+05	1.117E+06	.8914	.5995	23343.2	11525.6	16551.1	10895.7	22978.0	2.984E-06	1.103E-05
40.00	8.829E+05	6.331E+05	1.129E+06	.8737	.6265	22083.7	12274.1	15534.1	10939.8	23224.6	3.387E-06	1.032E-05
41.00	8.330E+05	6.376E+05	1.140E+06	.8540	.6535	20881.8	13059.3	14634.7	11038.9	23428.2	3.867E-06	9.574E-06
42.00	7.895E+05	6.456E+05	1.148E+06	.8325	.6808	19734.8	13882.9	13849.0	11199.6	23587.5	4.421E-06	8.801E-06
43.00	7.522E+05	6.575E+05	1.154E+06	.8096	.7077	18640.5	14746.7	13172.0	11428.9	23702.0	5.045E-06	8.014E-06
44.00	7.207E+05	6.738E+05	1.157E+06	.7854	.7342	17596.5	15652.5	12598.1	11733.8	23770.8	5.730E-06	7.229E-06
45.00	6.947E+05	6.947E+05	1.158E+06	.7602	.7602	16600.7	16602.3	12126.8	12121.5	23793.8	6.463E-06	6.462E-06

E GLASS/EPOXY -SPACEWIND-
FIBER COVERAGE RATIO = .875

FIBER PROPERTIES			RESIN PROPERTIES			COMPOSITE PROPERTIES	
VF = .5000	EF = 1.050E+07		VR = .5000	ER = 4.700E+05		RHO= .0583	
WF = .6907	EFT= 1.050E+07		WR = .3093	AR = 4.000E-05		FTU= 137500.0	
RHOF= .0920	GF = 4.000E+05		RHOR= .0412	UR = .3500		FCU= 92500.0	
FTU = 275000.0	AF = 2.800E-06		FSU = 8000.0			FSU= 8000.0	
FCU = 185000.0	AFT= 2.800E-06						
UF = .2200							

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	4.799E+06	1.357E+06	2.302E+05	.2850	.0806	120312.5	.0	80937.5	22513.2	4735.3	4.394E-06	1.386E-05
1.00	4.796E+06	1.357E+06	2.316E+05	.2861	.0809	120121.8	7.0	80889.1	22504.4	4953.0	4.391E-06	1.387E-05
2.00	4.786E+06	1.355E+06	2.358E+05	.2893	.0819	119552.7	28.1	80743.7	22478.0	5200.0	4.384E-06	1.387E-05
3.00	4.770E+06	1.352E+06	2.428E+05	.2946	.0835	118614.6	63.4	80500.8	22434.1	5479.0	4.373E-06	1.387E-05
4.00	4.747E+06	1.348E+06	2.524E+05	.3021	.0858	117322.6	112.8	80159.4	22372.6	5791.8	4.356E-06	1.387E-05
5.00	4.717E+06	1.343E+06	2.648E+05	.3117	.0888	115697.1	176.4	79718.4	22293.6	6139.8	4.335E-06	1.388E-05
6.00	4.680E+06	1.337E+06	2.798E+05	.3233	.0924	113762.7	254.5	79176.2	22197.1	6523.9	4.309E-06	1.389E-05
7.00	4.637E+06	1.330E+06	2.974E+05	.3369	.0966	111547.8	347.0	78531.1	22083.3	6944.3	4.279E-06	1.389E-05
8.00	4.587E+06	1.321E+06	3.174E+05	.3525	.1015	109083.2	454.2	77781.1	21952.2	7403.6	4.243E-06	1.390E-05
9.00	4.529E+06	1.312E+06	3.398E+05	.3701	.1072	106401.4	576.3	76924.4	21803.9	7891.9	4.203E-06	1.391E-05
10.00	4.465E+06	1.301E+06	3.644E+05	.3894	.1135	103535.4	713.5	75958.7	21638.6	8417.6	4.158E-06	1.392E-05
11.00	4.394E+06	1.290E+06	3.912E+05	.4105	.1205	100518.2	866.0	74882.3	21456.3	8974.1	4.108E-06	1.393E-05
12.00	4.316E+06	1.277E+06	4.200E+05	.4333	.1282	97381.8	1034.0	73693.3	21257.5	9561.4	4.052E-06	1.394E-05
13.00	4.231E+06	1.263E+06	4.507E+05	.4576	.1366	94156.6	1218.0	72390.5	21042.1	10176.7	3.992E-06	1.395E-05
14.00	4.140E+06	1.248E+06	4.831E+05	.4832	.1457	90871.1	1418.1	70972.9	20810.7	10817.6	3.927E-06	1.396E-05
15.00	4.041E+06	1.232E+06	5.170E+05	.5101	.1556	87551.3	1634.9	69440.5	20563.4	11481.7	3.857E-06	1.397E-05
16.00	3.936E+06	1.216E+06	5.524E+05	.5380	.1661	84221.0	1868.6	67793.9	20300.9	12166.3	3.781E-06	1.397E-05
17.00	3.825E+06	1.198E+06	5.889E+05	.5667	.1775	80900.9	2119.8	66034.8	20023.4	12868.8	3.701E-06	1.398E-05
18.00	3.709E+06	1.179E+06	6.266E+05	.5960	.1896	77609.4	2388.8	64166.2	19731.7	13586.5	3.616E-06	1.398E-05
19.00	3.588E+06	1.160E+06	6.651E+05	.6256	.2024	74362.1	2676.1	62192.4	19426.4	14316.7	3.527E-06	1.398E-05
20.00	3.456E+06	1.141E+06	7.042E+05	.6554	.2161	71172.3	2982.4	60119.3	19108.3	15056.4	3.433E-06	1.398E-05
21.00	3.323E+06	1.119E+06	7.439E+05	.6849	.2305	68050.9	3308.1	57954.5	18778.3	15802.7	3.336E-06	1.397E-05
22.00	3.186E+06	1.097E+06	7.838E+05	.7139	.2457	65006.6	3653.9	55707.3	18437.6	16552.7	3.235E-06	1.395E-05
23.00	3.046E+06	1.075E+06	8.238E+05	.7420	.2617	62046.4	4020.5	53388.7	18087.4	17303.3	3.131E-06	1.393E-05
24.00	2.904E+06	1.052E+06	8.638E+05	.7691	.2786	59175.5	4408.5	51011.6	17729.1	18051.5	3.026E-06	1.390E-05
25.00	2.760E+06	1.029E+06	9.034E+05	.7947	.2962	56397.6	4818.7	48590.4	17364.4	18794.1	2.920E-06	1.385E-05
26.00	2.616E+06	1.005E+06	9.426E+05	.8186	.3146	53715.1	5251.9	46141.1	16995.2	19527.9	2.815E-06	1.379E-05
27.00	2.471E+06	9.818E+05	9.811E+05	.8404	.3338	51129.4	5708.9	43680.8	16623.7	20249.5	2.713E-06	1.372E-05
28.00	2.329E+06	9.582E+05	1.019E+06	.8599	.3539	48640.8	6190.7	41227.4	16252.3	20955.8	2.616E-06	1.363E-05
29.00	2.188E+06	9.349E+05	1.055E+06	.8770	.3747	46249.0	6698.3	38799.6	15883.8	21643.4	2.527E-06	1.351E-05
30.00	2.051E+06	9.119E+05	1.091E+06	.8912	.3962	43952.8	7232.5	36415.7	15521.4	22309.1	2.450E-06	1.337E-05
31.00	1.919E+06	8.895E+05	1.125E+06	.9026	.4185	41750.7	7794.6	34093.9	15168.5	22949.6	2.387E-06	1.320E-05
32.00	1.791E+06	8.680E+05	1.157E+06	.9110	.4415	39640.8	8385.7	31851.4	14829.2	23561.7	2.345E-06	1.299E-05
33.00	1.670E+06	8.475E+05	1.188E+06	.9163	.4651	37620.7	9007.0	29704.1	14507.7	24142.4	2.329E-06	1.275E-05
34.00	1.555E+06	8.284E+05	1.216E+06	.9185	.4894	35687.8	9659.7	27666.3	14209.1	24688.6	2.345E-06	1.246E-05
35.00	1.447E+06	8.109E+05	1.243E+06	.9177	.5142	33839.5	10345.4	25750.0	13938.6	25197.6	2.400E-06	1.212E-05
36.00	1.347E+06	7.954E+05	1.268E+06	.9138	.5395	32072.9	11065.3	23965.4	13702.2	25666.6	2.500E-06	1.173E-05
37.00	1.256E+06	7.824E+05	1.290E+06	.9070	.5652	30385.0	11821.0	22319.9	13506.2	26093.2	2.655E-06	1.129E-05
38.00	1.172E+06	7.721E+05	1.310E+06	.8975	.5912	28773.0	12614.2	20818.7	13357.6	26475.2	2.869E-06	1.079E-05
39.00	1.097E+06	7.649E+05	1.328E+06	.8854	.6173	27233.7	13446.5	19464.4	13263.8	26810.4	3.150E-06	1.024E-05
40.00	1.030E+06	7.615E+05	1.343E+06	.8708	.6436	25764.4	14319.8	18257.6	13232.7	27097.2	3.502E-06	9.645E-06
41.00	9.718E+05	7.621E+05	1.355E+06	.8541	.6698	24362.0	15235.8	17196.6	13272.7	27333.9	3.925E-06	9.003E-06
42.00	9.214E+05	7.672E+05	1.365E+06	.8355	.6957	23023.9	16196.7	16277.9	13392.4	27519.4	4.418E-06	8.329E-06
43.00	8.787E+05	7.775E+05	1.372E+06	.8151	.7212	21747.2	17204.4	15496.3	13600.6	27652.5	4.977E-06	7.634E-06
44.00	8.434E+05	7.932E+05	1.376E+06	.7933	.7461	20529.3	18261.2	14845.5	13906.5	27732.7	5.591E-06	6.935E-06
45.00	8.150E+05	8.151E+05	1.377E+06	.7702	.7702	19367.5	19369.3	14318.1	14318.9	27759.4	6.249E-06	6.248E-06

E GLASS/EPOXY -SPACEWIND-
FIBER COVERAGE RATIO =1.000

FIBER PROPERTIES

VF = .5000
WF = .6907
RHOF= .0920
FTU = 275000.0
FCU = 185000.0
UF = .2200

EF = 1.050E+07
EFT= 1.050E+07
GF = 4.000E+06
AF = 2.800E-06
AFT= 2.800E-06

RESIN PROPERTIES

VR = .5000
WR = .3093
RHOR= .0412
FSU = 8000.0

ER = 4.700E+05
AR = 4.000E-05
UR = .3500

COMPOSITE PROPERTIES

RHO= .0666
FTU= 137500.0
FCU= 92500.0
FSU= 8000.0

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	5.485E+06	1.773E+06	2.631E+05	.2857	.0921	137500.0	.0	92500.0	29365.1	5451.6	4.394E-06	1.213E-05
1.00	5.481E+06	1.772E+06	2.647E+05	.2860	.0925	137282.6	8.0	92445.0	29352.7	5634.9	4.392E-06	1.213E-05
2.00	5.470E+06	1.771E+06	2.696E+05	.2889	.0935	136631.6	32.2	92279.8	29315.9	5973.5	4.386E-06	1.213E-05
3.00	5.451E+06	1.766E+06	2.778E+05	.2937	.0952	135559.5	72.4	92003.9	29254.4	6290.7	4.377E-06	1.214E-05
4.00	5.425E+06	1.760E+06	2.891E+05	.3005	.0975	134083.0	128.9	91616.3	29168.5	6648.7	4.363E-06	1.214E-05
5.00	5.391E+06	1.753E+06	3.035E+05	.3092	.1005	132225.2	201.6	91115.9	29058.0	7048.9	4.346E-06	1.215E-05
6.00	5.349E+06	1.744E+06	3.211E+05	.3197	.1043	130014.5	290.8	90501.0	28923.1	7491.9	4.325E-06	1.216E-05
7.00	5.299E+06	1.734E+06	3.416E+05	.3321	.1087	127483.2	396.6	89770.1	28763.8	7977.6	4.301E-06	1.216E-05
8.00	5.242E+06	1.722E+06	3.650E+05	.3463	.1138	124666.5	519.1	88921.1	28580.2	8505.3	4.271E-06	1.217E-05
9.00	5.177E+06	1.709E+06	3.911E+05	.3622	.1196	121601.6	658.7	87952.0	28372.5	9073.4	4.238E-06	1.219E-05
10.00	5.104E+06	1.694E+06	4.200E+05	.3799	.1261	118326.2	815.4	86860.8	28140.8	9680.1	4.200E-06	1.220E-05
11.00	5.024E+06	1.677E+06	4.513E+05	.3992	.1333	114878.0	989.7	85645.5	27885.0	10323.2	4.159E-06	1.221E-05
12.00	4.935E+06	1.659E+06	4.849E+05	.4200	.1412	111293.5	1181.7	84304.3	27605.7	11000.0	4.114E-06	1.222E-05
13.00	4.839E+06	1.640E+06	5.208E+05	.4422	.1499	107607.5	1392.0	82835.8	27303.0	11707.9	4.064E-06	1.224E-05
14.00	4.735E+06	1.619E+06	5.586E+05	.4658	.1593	103852.6	1620.7	81239.2	26977.3	12444.1	4.010E-06	1.225E-05
15.00	4.623E+06	1.596E+06	5.983E+05	.4906	.1694	100058.7	1868.5	79514.2	26629.0	13205.5	3.952E-06	1.227E-05
16.00	4.504E+06	1.572E+06	6.396E+05	.5164	.1803	96252.5	2135.6	77661.4	26258.6	13989.3	3.890E-06	1.228E-05
17.00	4.378E+06	1.547E+06	6.824E+05	.5431	.1920	92458.2	2422.6	75682.4	25866.7	14792.3	3.823E-06	1.229E-05
18.00	4.245E+06	1.521E+06	7.264E+05	.5705	.2044	88696.4	2730.0	73580.3	25453.9	15611.5	3.752E-06	1.231E-05
19.00	4.106E+06	1.493E+06	7.714E+05	.5984	.2176	84985.3	3058.4	71359.3	25021.2	16443.9	3.677E-06	1.232E-05
20.00	3.961E+06	1.464E+06	8.171E+05	.6265	.2316	81339.8	3408.4	69025.4	24569.6	17286.3	3.599E-06	1.233E-05
21.00	3.810E+06	1.434E+06	8.635E+05	.6545	.2464	77772.4	3780.7	66586.2	24100.1	18135.4	3.517E-06	1.233E-05
22.00	3.655E+06	1.403E+06	9.101E+05	.6824	.2620	74293.3	4175.9	64051.4	23614.3	18988.2	3.431E-06	1.233E-05
23.00	3.496E+06	1.371E+06	9.569E+05	.7096	.2783	70910.2	4594.8	61432.4	23113.6	19841.1	3.343E-06	1.233E-05
24.00	3.335E+06	1.339E+06	1.004E+06	.7361	.2955	67629.1	5038.2	58742.9	22599.9	20690.9	3.253E-06	1.232E-05
25.00	3.171E+06	1.305E+06	1.050E+06	.7615	.3135	64454.4	5507.0	55998.1	22075.4	21534.1	3.162E-06	1.230E-05
26.00	3.006E+06	1.272E+06	1.096E+06	.7854	.3323	61388.7	6002.1	53215.1	21542.5	22367.0	3.071E-06	1.227E-05
27.00	2.841E+06	1.238E+06	1.141E+06	.8078	.3518	58433.6	6524.5	50412.8	21004.0	23186.2	2.982E-06	1.223E-05
28.00	2.678E+06	1.203E+06	1.185E+06	.8281	.3721	55589.5	7075.1	47611.0	20463.1	23988.0	2.896E-06	1.217E-05
29.00	2.517E+06	1.169E+06	1.227E+06	.8464	.3932	52856.6	7655.2	44830.5	19923.5	24768.7	2.816E-06	1.210E-05
30.00	2.360E+06	1.136E+06	1.269E+06	.8622	.4149	50231.8	8265.7	42092.4	19389.2	25524.6	2.745E-06	1.201E-05
31.00	2.207E+06	1.103E+06	1.308E+06	.8755	.4374	47715.1	8908.1	39417.9	18864.9	26252.0	2.686E-06	1.189E-05
32.00	2.060E+06	1.072E+06	1.346E+06	.8861	.4605	45303.8	9583.7	36827.4	18355.7	26947.5	2.643E-06	1.174E-05
33.00	1.919E+06	1.042E+06	1.382E+06	.8938	.4842	42995.1	10293.7	34346.3	17867.4	27607.4	2.622E-06	1.155E-05
34.00	1.786E+06	1.013E+06	1.416E+06	.8987	.5084	40786.1	11039.7	31974.2	17406.3	28228.5	2.628E-06	1.134E-05
35.00	1.661E+06	9.832E+05	1.447E+06	.9006	.5331	38673.8	11823.3	29745.0	16979.4	28807.3	2.668E-06	1.109E-05
36.00	1.545E+06	9.586E+05	1.476E+06	.8996	.5581	36654.7	12646.0	27665.8	16594.4	29341.0	2.747E-06	1.078E-05
37.00	1.439E+06	9.369E+05	1.502E+06	.8958	.5834	34725.7	13509.7	25747.4	16259.6	29825.6	2.875E-06	1.042E-05
38.00	1.342E+06	9.188E+05	1.526E+06	.8892	.6089	32883.4	14416.2	23997.7	15984.0	30261.5	3.056E-06	1.001E-05
39.00	1.255E+06	9.046E+05	1.546E+06	.8799	.6344	31124.2	15367.5	22421.6	15777.0	30643.4	3.298E-06	9.551E-06
40.00	1.178E+06	8.950E+05	1.564E+06	.8682	.6598	29445.0	16365.5	21021.3	15648.8	30970.1	3.604E-06	9.041E-06
41.00	1.111E+06	8.906E+05	1.578E+06	.8542	.6850	27842.3	17412.4	19796.6	15610.0	31239.9	3.977E-06	8.487E-06
42.00	1.053E+06	8.919E+05	1.589E+06	.8381	.7097	26313.0	18510.5	18744.5	15671.3	31451.3	4.416E-06	7.898E-06
43.00	1.005E+06	8.996E+05	1.597E+06	.8202	.7338	24853.9	19662.2	17860.1	15843.9	31603.2	4.914E-06	7.286E-06
44.00	9.666E+05	9.142E+05	1.602E+06	.8005	.7572	23462.0	20870.0	17136.6	16138.7	31694.6	5.464E-06	6.666E-06
45.00	9.364E+05	9.364E+05	1.604E+06	.7794	.7795	22134.3	22136.4	16565.7	16566.5	31725.1	6.053E-06	6.053E-06

S GLASS/EPOXY -SPACEWIND-
FIBER COVERAGE RATIO = .250

FIBER PROPERTIES		RESIN PROPERTIES		COMPOSITE PROPERTIES
VF = .5000	EF = 1.260E+07	VR = .5000	ER = 4.760E+05	RHO= .0164
WF = .6860	EFT= 1.260E+07	WR = .3140	AR = 4.000E-05	FTU= 162500.0
RHOF= .0900	GF = 4.000E+05	RHOR= .0412	UR = .3500	FCU= 107500.0
FTU = 325000.0	AF = 2.200E-06	FSU = 8000.0		FSU= 8000.0
FCU = 215000.0	AFT= 2.200E-06			
UF = .2200				

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	1.634E+06	1.139E+05	6.578E+04	.2850	.0199	40625.0	.0	26875.0	1864.4	1305.9	3.559E-06	4.701E-05
1.00	1.633E+06	1.139E+05	6.621E+04	.2887	.0201	40548.3	2.0	26858.1	1864.2	1380.5	3.548E-06	4.699E-05
2.00	1.629E+06	1.140E+05	6.752E+04	.2999	.0210	40319.7	8.0	26807.2	1864.9	1461.3	3.515E-06	4.693E-05
3.00	1.623E+06	1.140E+05	6.968E+04	.3183	.0224	39943.8	18.0	26721.4	1866.0	1548.5	3.460E-06	4.684E-05
4.00	1.615E+06	1.141E+05	7.270E+04	.3439	.0243	39427.9	32.0	26599.3	1867.5	1642.9	3.383E-06	4.671E-05
5.00	1.604E+06	1.142E+05	7.655E+04	.3763	.0268	38781.7	50.0	26439.3	1869.5	1744.8	3.284E-06	4.654E-05
6.00	1.591E+06	1.144E+05	8.122E+04	.4153	.0299	38017.2	72.1	26239.0	1872.0	1854.9	3.164E-06	4.633E-05
7.00	1.575E+06	1.146E+05	8.669E+04	.4603	.0335	37147.4	98.4	25996.1	1875.1	1973.7	3.024E-06	4.609E-05
8.00	1.556E+06	1.148E+05	9.292E+04	.5110	.0377	36186.7	128.8	25708.0	1878.6	2101.6	2.864E-06	4.583E-05
9.00	1.534E+06	1.150E+05	9.990E+04	.5666	.0425	35149.7	163.5	25372.0	1882.8	2239.1	2.685E-06	4.547E-05
10.00	1.509E+06	1.153E+05	1.076E+05	.6264	.0479	34051.0	202.4	24985.7	1887.6	2386.7	2.488E-06	4.511E-05
11.00	1.480E+06	1.156E+05	1.159E+05	.6895	.0539	32904.9	245.7	24547.2	1893.1	2544.8	2.273E-06	4.473E-05
12.00	1.449E+06	1.160E+05	1.249E+05	.7551	.0605	31724.7	293.5	24055.0	1899.3	2713.5	2.043E-06	4.424E-05
13.00	1.414E+06	1.164E+05	1.344E+05	.8220	.0677	30522.9	345.7	23508.5	1906.3	2893.2	1.798E-06	4.374E-05
14.00	1.376E+06	1.169E+05	1.445E+05	.8893	.0755	29310.7	402.7	22908.0	1914.2	3084.0	1.540E-06	4.321E-05
15.00	1.335E+06	1.174E+05	1.551E+05	.9557	.0840	28098.1	464.4	22255.0	1923.1	3285.8	1.270E-06	4.261E-05
16.00	1.291E+06	1.180E+05	1.661E+05	1.0202	.0932	26893.8	530.9	21552.1	1933.0	3498.5	9.920E-07	4.197E-05
17.00	1.245E+06	1.186E+05	1.775E+05	1.0815	.1031	25705.3	602.5	20803.3	1944.1	3721.8	7.067E-07	4.129E-05
18.00	1.196E+06	1.193E+05	1.892E+05	1.1388	.1136	24538.5	679.2	20013.8	1956.4	3955.4	4.170E-07	4.055E-05
19.00	1.145E+06	1.201E+05	2.012E+05	1.1909	.1249	23398.6	761.2	19189.8	1970.1	4198.4	1.256E-07	3.976E-05
20.00	1.094E+06	1.210E+05	2.134E+05	1.2371	.1369	22289.4	848.6	18338.6	1985.4	4450.2	-1.642E-07	3.892E-05
21.00	1.041E+06	1.221E+05	2.258E+05	1.2766	.1497	21214.2	941.7	17468.1	2002.3	4709.8	-4.492E-07	3.803E-05
22.00	9.877E+05	1.232E+05	2.382E+05	1.3092	.1633	20174.9	1040.6	16586.5	2021.1	4975.9	-7.255E-07	3.708E-05
23.00	9.345E+05	1.244E+05	2.507E+05	1.3343	.1776	19173.2	1145.6	15702.4	2041.9	5247.3	-9.892E-07	3.609E-05
24.00	8.819E+05	1.258E+05	2.631E+05	1.3520	.1928	18209.9	1256.8	14823.7	2065.0	5522.4	-1.236E-06	3.503E-05
25.00	8.303E+05	1.273E+05	2.755E+05	1.3622	.2088	17285.5	1374.5	13958.3	2091.6	5799.7	-1.461E-06	3.393E-05
26.00	7.799E+05	1.290E+05	2.877E+05	1.3653	.2258	16399.8	1498.9	13113.1	2118.9	6077.3	-1.659E-06	3.277E-05
27.00	7.313E+05	1.308E+05	2.996E+05	1.3615	.2436	15552.5	1630.4	12294.1	2150.3	6353.4	-1.826E-06	3.157E-05
28.00	6.846E+05	1.329E+05	3.114E+05	1.3514	.2623	14742.9	1769.1	11506.4	2185.0	6626.2	-1.955E-06	3.031E-05
29.00	6.400E+05	1.352E+05	3.227E+05	1.3355	.2821	13970.2	1915.5	10754.0	2223.4	6893.7	-2.042E-06	2.901E-05
30.00	5.978E+05	1.377E+05	3.336E+05	1.3144	.3028	13233.4	2069.8	10039.9	2265.8	7154.1	-2.080E-06	2.766E-05
31.00	5.580E+05	1.405E+05	3.443E+05	1.2888	.3245	12531.2	2232.3	9366.2	2312.8	7405.4	-2.063E-06	2.627E-05
32.00	5.206E+05	1.436E+05	3.544E+05	1.2592	.3473	11862.6	2403.5	8733.8	2364.7	7646.0	-1.986E-06	2.485E-05
33.00	4.857E+05	1.470E+05	3.640E+05	1.2264	.3711	11226.1	2583.7	8143.0	2422.1	7874.2	-1.843E-06	2.343E-05
34.00	4.533E+05	1.508E+05	3.729E+05	1.1908	.3961	10620.4	2773.4	7593.5	2485.6	8088.6	-1.629E-06	2.192E-05
35.00	4.232E+05	1.549E+05	3.813E+05	1.1531	.4222	10044.3	2973.0	7084.4	2555.7	8287.9	-1.339E-06	2.043E-05
36.00	3.954E+05	1.595E+05	3.890E+05	1.1138	.4494	9496.5	3183.0	6614.3	2633.2	8470.9	-9.688E-07	1.892E-05
37.00	3.699E+05	1.646E+05	3.959E+05	1.0734	.4778	8975.6	3403.9	6181.5	2718.9	8636.6	-5.143E-07	1.741E-05
38.00	3.464E+05	1.703E+05	4.022E+05	1.0322	.5074	8480.4	3636.2	5784.1	2813.6	8784.3	2.735E-08	1.591E-05
39.00	3.248E+05	1.765E+05	4.076E+05	.9906	.5382	8009.6	3880.6	5420.0	2918.1	8913.3	6.581E-07	1.442E-05
40.00	3.051E+05	1.834E+05	4.123E+05	.9489	.5702	7562.0	4137.5	5087.2	3033.6	9023.1	1.379E-06	1.296E-05
41.00	2.872E+05	1.909E+05	4.162E+05	.9075	.6034	7136.6	4407.7	4783.4	3161.2	9113.3	2.195E-06	1.153E-05
42.00	2.708E+05	1.993E+05	4.192E+05	.8665	.6378	6732.2	4691.8	4506.5	3302.1	9183.8	3.089E-06	1.013E-05
43.00	2.558E+05	2.085E+05	4.213E+05	.8261	.6734	6347.7	4990.6	4254.5	3457.3	9234.2	4.075E-06	8.792E-06
44.00	2.423E+05	2.187E+05	4.226E+05	.7864	.7100	5982.2	5304.8	4025.4	3628.7	9264.5	5.144E-06	7.509E-06
45.00	2.299E+05	2.299E+05	4.231E+05	.7477	.7478	5634.7	5635.2	3817.3	3817.8	9274.6	6.291E-06	6.289E-06

S GLASS/EPOXY -SPACEWIND-
FIBER COVERAGE RATIO = .375

FIBER PROPERTIES

VF = .5000
WF = .6860
RHOF= .0900
FTU = 325000.0
FCU = 215000.0
UF = .2200
EF = 1.260E+07
EFT= 1.260E+07
GF = 4.800E+05
AF = 2.200E-06
AFT= 2.200E-06

RESIN PROPERTIES

VR = .5000
WR = .3140
RHOR= .0412
FSU = 8000.0
ER = 4.700E+05
AR = 4.000E-05
UR = .3500

COMPOSITE PROPERTIES

RHO= .0246
FTU= 162500.0
FCU= 107500.0
FSU= 8000.0

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	2.451E+06	2.563E+05	9.866E+04	.2850	.0298	60937.5	.0	40312.5	4184.1	1972.8	3.559E-06	3.134E-05
1.00	2.449E+06	2.563E+05	9.933E+04	.2876	.0301	60822.4	3.0	40287.3	4183.6	2081.7	3.552E-06	3.133E-05
2.00	2.444E+06	2.562E+05	1.013E+05	.2953	.0310	60479.5	12.0	40211.4	4182.1	2201.0	3.531E-06	3.132E-05
3.00	2.435E+06	2.560E+05	1.046E+05	.3080	.0324	59915.6	26.9	40084.0	4179.6	2331.6	3.495E-06	3.129E-05
4.00	2.423E+06	2.558E+05	1.093E+05	.3258	.0344	59141.8	47.9	39903.8	4176.1	2474.4	3.446E-06	3.125E-05
5.00	2.407E+06	2.555E+05	1.152E+05	.3484	.0370	58172.6	75.0	39668.9	4171.6	2630.3	3.382E-06	3.120E-05
6.00	2.387E+06	2.551E+05	1.223E+05	.3757	.0402	57025.8	108.2	39377.0	4166.2	2800.1	3.305E-06	3.114E-05
7.00	2.364E+06	2.547E+05	1.307E+05	.4075	.0439	55721.2	147.6	39025.8	4159.9	2984.5	3.213E-06	3.107E-05
8.00	2.336E+06	2.542E+05	1.402E+05	.4435	.0483	54280.1	193.2	38612.3	4152.8	3184.2	3.108E-06	3.098E-05
9.00	2.304E+06	2.537E+05	1.509E+05	.4835	.0532	52724.6	245.2	38133.8	4144.8	3399.7	2.990E-06	3.088E-05
10.00	2.268E+06	2.532E+05	1.627E+05	.5270	.0588	51076.6	303.6	37587.6	4136.2	3631.6	2.858E-06	3.076E-05
11.00	2.228E+06	2.525E+05	1.754E+05	.5735	.0650	49357.3	368.6	36971.1	4126.9	3880.1	2.713E-06	3.063E-05
12.00	2.183E+06	2.519E+05	1.892E+05	.6226	.0718	47587.0	440.2	36282.3	4117.0	4145.2	2.556E-06	3.048E-05
13.00	2.134E+06	2.512E+05	2.038E+05	.6738	.0793	45784.3	518.6	35519.9	4106.7	4427.1	2.386E-06	3.032E-05
14.00	2.080E+06	2.505E+05	2.192E+05	.7262	.0874	43966.0	604.0	34683.4	4096.0	4725.4	2.206E-06	3.013E-05
15.00	2.023E+06	2.497E+05	2.354E+05	.7794	.0962	42147.2	696.5	33773.5	4085.1	5039.7	2.014E-06	2.992E-05
16.00	1.961E+06	2.491E+05	2.523E+05	.8325	.1057	40344.6	796.4	32792.2	4074.1	5369.4	1.813E-06	2.969E-05
17.00	1.895E+06	2.483E+05	2.697E+05	.8847	.1159	38557.9	903.7	31742.7	4063.2	5713.7	1.603E-06	2.943E-05
18.00	1.826E+06	2.475E+05	2.877E+05	.9353	.1268	36807.7	1018.7	30630.0	4052.6	6071.6	1.385E-06	2.915E-05
19.00	1.753E+06	2.468E+05	3.060E+05	.9835	.1385	35097.8	1141.7	29460.3	4042.5	6441.7	1.161E-06	2.884E-05
20.00	1.678E+06	2.462E+05	3.247E+05	1.0286	.1509	33434.2	1272.9	28241.6	4033.1	6822.8	9.334E-07	2.850E-05
21.00	1.602E+06	2.455E+05	3.436E+05	1.0698	.1640	31821.2	1412.6	26983.0	4024.6	7213.1	7.031E-07	2.812E-05
22.00	1.523E+06	2.450E+05	3.626E+05	1.1067	.1780	30262.4	1560.9	25694.7	4017.4	7610.9	4.730E-07	2.771E-05
23.00	1.445E+06	2.446E+05	3.817E+05	1.1386	.1928	28759.8	1718.4	24387.8	4011.6	8014.2	2.458E-07	2.725E-05
24.00	1.366E+06	2.442E+05	4.008E+05	1.1651	.2084	27314.9	1885.2	23073.6	4008.2	8420.9	2.467E-08	2.676E-05
25.00	1.287E+06	2.440E+05	4.197E+05	1.1861	.2249	25928.2	2061.7	21763.8	4007.0	8828.8	-1.866E-07	2.622E-05
26.00	1.210E+06	2.440E+05	4.384E+05	1.2012	.2422	24599.7	2248.4	20469.6	4008.5	9235.6	-3.841E-07	2.563E-05
27.00	1.135E+06	2.442E+05	4.567E+05	1.2106	.2605	23328.7	2445.6	19201.6	4013.5	9638.8	-5.629E-07	2.500E-05
28.00	1.062E+06	2.446E+05	4.746E+05	1.2143	.2797	22114.4	2653.7	17969.4	4022.4	10036.1	-7.180E-07	2.431E-05
29.00	9.917E+05	2.452E+05	4.921E+05	1.2124	.2998	20955.3	2873.2	16781.4	4035.8	10425.1	-8.438E-07	2.356E-05
30.00	9.247E+05	2.462E+05	5.089E+05	1.2053	.3209	19850.1	3104.6	15644.7	4054.5	10803.2	-9.339E-07	2.276E-05
31.00	8.612E+05	2.476E+05	5.251E+05	1.1933	.3430	18796.8	3348.5	14565.0	4079.3	11168.2	-9.819E-07	2.191E-05
32.00	8.014E+05	2.493E+05	5.406E+05	1.1769	.3661	17793.8	3605.3	13546.3	4111.1	11517.8	-9.807E-07	2.099E-05
33.00	7.454E+05	2.515E+05	5.552E+05	1.1565	.3903	16839.1	3875.6	12591.6	4150.9	11849.9	-9.233E-07	2.002E-05
34.00	6.933E+05	2.543E+05	5.689E+05	1.1325	.4154	15930.6	4160.2	11702.1	4199.7	12162.4	-8.023E-07	1.900E-05
35.00	6.450E+05	2.577E+05	5.817E+05	1.1055	.4417	15066.5	4459.6	10878.3	4258.9	12453.6	-6.106E-07	1.792E-05
36.00	6.005E+05	2.617E+05	5.935E+05	1.0760	.4690	14244.8	4774.6	10119.3	4329.6	12721.7	-3.421E-07	1.680E-05
37.00	5.598E+05	2.666E+05	6.041E+05	1.0443	.4973	13463.4	5105.9	9423.7	4413.5	12965.2	9.640E-09	1.563E-05
38.00	5.226E+05	2.723E+05	6.137E+05	1.0109	.5267	12720.6	5454.4	8789.0	4512.2	13183.0	4.494E-07	1.444E-05
39.00	4.889E+05	2.790E+05	6.221E+05	.9762	.5571	12014.4	5820.8	8212.7	4627.4	13373.8	9.807E-07	1.322E-05
40.00	4.584E+05	2.868E+05	6.292E+05	.9406	.5885	11343.1	6206.2	7691.4	4761.3	13536.7	1.605E-06	1.198E-05
41.00	4.309E+05	2.958E+05	6.351E+05	.9043	.6209	10704.9	6611.5	7221.9	4915.9	13671.0	2.324E-06	1.075E-05
42.00	4.062E+05	3.062E+05	6.397E+05	.8678	.6542	10098.3	7037.7	6800.7	5093.5	13776.1	3.133E-06	9.525E-06
43.00	3.841E+05	3.181E+05	6.430E+05	.8312	.6884	9521.6	7485.8	6424.2	5296.9	13851.4	4.029E-06	8.326E-06
44.00	3.645E+05	3.317E+05	6.450E+05	.7948	.7233	8973.3	7957.1	6088.9	5526.7	13896.8	5.007E-06	7.165E-06
45.00	3.470E+05	3.471E+05	6.457E+05	.7587	.7588	8452.0	8452.8	5791.3	5791.8	13911.9	6.056E-06	6.054E-06

S GLASS/EPOXY -SPACEWIND-
FIBER COVERAGE RATIO = .500

FIBER PROPERTIES

VF = .5000
WF = .6860
RHOF= .0900
FTU = 325000.0
FCU = 215000.0
UF = .2200

EF = 1.260E+07
EFT= 1.260E+07
GF = 4.600E+05
AF = 2.200E-06
AFT= 2.200E-06

RESIN PROPERTIES

VR = .5000
WR = .3140
RHOR= .0412
FSU = 8000.0

ER = 4.700E+05
AR = 4.000E-05
UR = .3500

COMPOSITE PROPERTIES

RHO= .0328
FTU= 162500.0
FCU= 107500.0
FSU= 8000.0

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	3.267E+06	4.557E+05	1.316E+05	.2850	.0397	81250.0	.0	53750.0	7422.4	2648.5	3.559E-06	2.350E-05
1.00	3.255E+06	4.555E+05	1.325E+05	.2870	.0400	81096.6	4.0	53716.6	7420.6	2790.1	3.554E-06	2.350E-05
2.00	3.258E+06	4.552E+05	1.352E+05	.2930	.0409	80639.4	16.0	53616.0	7415.2	2947.0	3.539E-06	2.350E-05
3.00	3.247E+06	4.546E+05	1.397E+05	.3029	.0424	79887.5	35.9	53447.4	7406.3	3120.8	3.513E-06	2.349E-05
4.00	3.231E+06	4.538E+05	1.460E+05	.3167	.0445	78855.7	63.9	53209.4	7393.8	3312.7	3.478E-06	2.348E-05
5.00	3.209E+06	4.528E+05	1.540E+05	.3343	.0472	77563.5	100.0	52900.4	7377.8	3524.0	3.432E-06	2.346E-05
6.00	3.184E+06	4.515E+05	1.637E+05	.3556	.0504	76034.4	144.3	52517.9	7358.3	3755.6	3.376E-06	2.345E-05
7.00	3.153E+06	4.501E+05	1.751E+05	.3806	.0543	74294.9	196.8	52059.4	7335.4	4008.5	3.309E-06	2.342E-05
8.00	3.116E+06	4.484E+05	1.881E+05	.4090	.0588	72373.5	257.6	51522.2	7309.1	4283.4	3.233E-06	2.340E-05
9.00	3.075E+06	4.465E+05	2.026E+05	.4406	.0640	70299.5	326.9	50903.1	7279.6	4580.6	3.146E-06	2.337E-05
10.00	3.028E+06	4.443E+05	2.186E+05	.4752	.0697	68102.1	404.8	50199.4	7246.8	4900.5	3.049E-06	2.333E-05
11.00	2.976E+06	4.420E+05	2.360E+05	.5126	.0761	65809.8	491.4	49408.3	7210.9	5243.0	2.943E-06	2.328E-05
12.00	2.918E+06	4.395E+05	2.547E+05	.5524	.0832	63449.4	586.9	48527.4	7172.0	5607.9	2.826E-06	2.323E-05
13.00	2.855E+06	4.368E+05	2.746E+05	.5942	.0909	61045.7	691.5	47555.1	7130.3	5994.8	2.699E-06	2.318E-05
14.00	2.786E+06	4.340E+05	2.956E+05	.6376	.0993	58621.4	805.4	46490.3	7085.8	6402.9	2.563E-06	2.311E-05
15.00	2.712E+06	4.309E+05	3.176E+05	.6821	.1084	56196.2	928.7	45333.3	7038.6	6831.3	2.418E-06	2.303E-05
16.00	2.632E+06	4.277E+05	3.405E+05	.7273	.1182	53787.7	1061.8	44085.5	6989.5	7278.8	2.264E-06	2.294E-05
17.00	2.548E+06	4.244E+05	3.643E+05	.7725	.1287	51410.5	1204.9	42749.6	6938.1	7744.0	2.102E-06	2.284E-05
18.00	2.459E+06	4.210E+05	3.887E+05	.8173	.1399	49077.0	1358.3	41330.2	6884.9	8225.5	1.931E-06	2.272E-05
19.00	2.365E+06	4.174E+05	4.136E+05	.8609	.1519	46797.1	1522.3	39833.5	6830.2	8721.2	1.754E-06	2.259E-05
20.00	2.269E+06	4.138E+05	4.391E+05	.9028	.1647	44578.9	1697.2	38267.4	6774.2	9229.5	1.572E-06	2.244E-05
21.00	2.169E+06	4.101E+05	4.648E+05	.9425	.1782	42428.3	1883.4	36641.7	6717.5	9748.0	1.384E-06	2.226E-05
22.00	2.066E+06	4.064E+05	4.907E+05	.9793	.1926	40349.8	2081.3	34967.5	6660.4	10274.5	1.194E-06	2.207E-05
23.00	1.963E+06	4.027E+05	5.167E+05	1.0127	.2078	38346.4	2291.2	33257.6	6603.5	10806.6	1.002E-06	2.185E-05
24.00	1.858E+06	3.990E+05	5.426E+05	1.0423	.2238	36419.9	2513.6	31525.6	6547.3	11341.7	8.115E-07	2.161E-05
25.00	1.754E+06	3.954E+05	5.683E+05	1.0676	.2407	34571.0	2749.0	29785.9	6492.5	11877.2	6.247E-07	2.131E-05
26.00	1.650E+06	3.919E+05	5.937E+05	1.0884	.2585	32799.6	2997.9	28053.0	6439.7	12410.1	4.451E-07	2.099E-05
27.00	1.549E+06	3.886E+05	6.187E+05	1.1045	.2771	31105.0	3260.8	26341.5	6389.9	12937.7	2.759E-07	2.063E-05
28.00	1.449E+06	3.855E+05	6.431E+05	1.1157	.2967	29485.8	3538.3	24665.1	6343.8	13457.1	1.226E-07	2.027E-05
29.00	1.353E+06	3.826E+05	6.668E+05	1.1220	.3172	27940.5	3831.0	23036.7	6302.6	13965.3	-1.176E-08	1.978E-05
30.00	1.261E+06	3.802E+05	6.897E+05	1.1235	.3387	26466.8	4139.5	21467.6	6267.4	14459.4	-1.197E-07	1.928E-05
31.00	1.173E+06	3.781E+05	7.118E+05	1.1203	.3611	25062.5	4464.6	19967.9	6239.6	14936.6	-1.955E-07	1.873E-05
32.00	1.090E+06	3.766E+05	7.328E+05	1.1128	.3845	23725.1	4807.0	18545.4	6220.4	15394.0	-2.322E-07	1.812E-05
33.00	1.012E+06	3.757E+05	7.527E+05	1.1010	.4089	22452.1	5167.5	17206.5	6211.7	15828.9	-2.221E-07	1.745E-05
34.00	9.387E+05	3.756E+05	7.713E+05	1.0855	.4343	21240.9	5546.9	15955.5	6215.1	16238.8	-1.572E-07	1.671E-05
35.00	8.711E+05	3.762E+05	7.887E+05	1.0665	.4606	20088.7	5946.1	14795.0	6232.8	16621.2	-2.955E-08	1.592E-05
36.00	8.089E+05	3.779E+05	8.047E+05	1.0444	.4878	18993.1	6366.1	13725.8	6266.9	16974.0	1.69CE-07	1.506E-05
37.00	7.520E+05	3.806E+05	8.192E+05	1.0196	.5160	17951.2	6807.8	12747.5	6319.8	17295.0	4.458E-07	1.415E-05
38.00	7.004E+05	3.847E+05	8.322E+05	.9926	.5452	16960.8	7272.5	11858.2	6394.4	17582.5	8.076E-07	1.318E-05
39.00	6.537E+05	3.901E+05	8.436E+05	.9637	.5751	16019.2	7761.1	11055.1	6493.6	17834.9	1.259E-06	1.217E-05
40.00	6.119E+05	3.973E+05	8.533E+05	.9332	.6059	15124.1	8275.0	10334.5	6620.7	18050.8	1.804E-06	1.113E-05
41.00	5.746E+05	4.063E+05	8.614E+05	.9015	.6374	14273.2	8815.3	9692.2	6779.2	18229.0	2.442E-06	1.006E-05
42.00	5.416E+05	4.173E+05	8.677E+05	.8690	.6696	13464.4	9383.5	9123.4	6972.9	18368.6	3.172E-06	8.978E-06
43.00	5.126E+05	4.307E+05	8.722E+05	.8359	.7024	12695.4	9981.1	8623.1	7206.0	18468.7	3.988E-06	7.905E-06
44.00	4.873E+05	4.467E+05	8.749E+05	.8025	.7355	11964.4	10609.5	8186.2	7482.9	18529.1	4.882E-06	6.853E-06
45.00	4.654E+05	4.654E+05	8.758E+05	.7689	.7689	11269.3	11270.4	7807.7	7808.2	18549.2	5.842E-06	5.840E-06

S GLASS/EPOXY -SPACEWIND-
FIBER COVERAGE RATIO = .625

FIBER PROPERTIES

VF = .5000
WF = .6860
RHOF= .0900
FTU = 325000.0
FCU = 215000.0
UF = .2200

EF = 1.260E+07
EFT= 1.260E+07
GF = 4.000E+05
AF = 2.200E-06
AFT= 2.200E-06

RESIN PROPERTIES

VR = .5000
WR = .3140
RHOR= .0412
FSU = 8000.0

ER = 4.700E+05
AR = 4.000E-05
UR = .3500

COMPOSITE PROPERTIES

RHO= .0410
FTU= 162500.0
FCU= 107500.0
FSU= 8000.0

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	4.084E+06	7.120E+05	1.644E+05	.2850	.0497	101562.5	.0	67187.5	11574.5	3332.8	3.559E-06	1.881E-05
1.00	4.082E+06	7.117E+05	1.656E+05	.2866	.0500	101376.7	5.0	67145.9	11570.9	3505.5	3.555E-06	1.884E-05
2.00	4.073E+06	7.110E+05	1.691E+05	.2916	.0509	100799.2	19.9	67020.8	11560.0	3699.4	3.544E-06	1.882E-05
3.00	4.058E+06	7.099E+05	1.748E+05	.2998	.0524	99859.4	44.9	66811.4	11541.8	3916.2	3.524E-06	1.880E-05
4.00	4.038E+06	7.082E+05	1.828E+05	.3112	.0546	98569.6	79.9	66516.3	11516.4	4157.8	3.497E-06	1.880E-05
5.00	4.012E+06	7.061E+05	1.931E+05	.3258	.0573	96954.3	125.0	66133.8	11483.8	4425.7	3.462E-06	1.880E-05
6.00	3.980E+06	7.036E+05	2.055E+05	.3435	.0607	95042.9	180.4	65661.6	11444.1	4721.0	3.419E-06	1.880E-05
7.00	3.941E+06	7.005E+05	2.200E+05	.3643	.0647	92868.6	246.0	65096.9	11397.3	5044.6	3.368E-06	1.880E-05
8.00	3.897E+06	6.971E+05	2.365E+05	.3880	.0694	90466.9	322.0	64437.1	11343.4	5397.0	3.309E-06	1.879E-05
9.00	3.846E+06	6.931E+05	2.551E+05	.4144	.0747	87874.3	408.7	63679.1	11282.6	5778.5	3.242E-06	1.879E-05
10.00	3.788E+06	6.888E+05	2.754E+05	.4435	.0806	85127.6	506.0	62819.8	11215.0	6188.9	3.167E-06	1.878E-05
11.00	3.724E+06	6.841E+05	2.976E+05	.4751	.0872	82262.2	614.3	61856.4	11140.6	6627.8	3.084E-06	1.877E-05
12.00	3.654E+06	6.788E+05	3.214E+05	.5088	.0945	79311.7	733.6	60786.3	11059.7	7094.4	2.993E-06	1.876E-05
13.00	3.578E+06	6.732E+05	3.468E+05	.5445	.1025	76307.1	864.4	59607.6	10972.4	7587.8	2.894E-06	1.874E-05
14.00	3.492E+06	6.671E+05	3.736E+05	.5818	.1111	73276.7	1006.7	58319.0	10878.8	8106.6	2.787E-06	1.873E-05
15.00	3.402E+06	6.607E+05	4.017E+05	.6204	.1205	70245.3	1160.9	56920.4	10779.3	8649.4	2.672E-06	1.871E-05
16.00	3.305E+06	6.539E+05	4.309E+05	.6600	.1306	67234.6	1327.3	55412.8	10674.1	9214.6	2.549E-06	1.869E-05
17.00	3.202E+06	6.468E+05	4.612E+05	.7001	.1414	64263.1	1506.2	53798.6	10563.5	9800.1	2.419E-06	1.866E-05
18.00	3.093E+06	6.394E+05	4.923E+05	.7402	.1530	61346.2	1697.9	52082.0	10447.8	10403.9	2.282E-06	1.859E-05
19.00	2.980E+06	6.316E+05	5.241E+05	.7799	.1653	58496.4	1902.9	50269.2	10327.5	11023.9	2.139E-06	1.854E-05
20.00	2.861E+06	6.236E+05	5.565E+05	.8188	.1784	55723.6	2121.5	48367.9	10203.0	11657.5	1.989E-06	1.847E-05
21.00	2.739E+06	6.153E+05	5.893E+05	.8562	.1924	53035.4	2354.3	46388.2	10074.9	12302.4	1.834E-06	1.840E-05
22.00	2.613E+06	6.069E+05	6.224E+05	.8917	.2071	50437.3	2601.6	44342.0	9943.8	12955.6	1.675E-06	1.833E-05
23.00	2.485E+06	5.983E+05	6.555E+05	.9249	.2227	47933.1	2864.0	42242.9	9810.4	13614.5	1.513E-06	1.819E-05
24.00	2.356E+06	5.895E+05	6.885E+05	.9553	.2391	45524.9	3142.0	40106.2	9675.5	14276.1	1.349E-06	1.806E-05
25.00	2.226E+06	5.808E+05	7.213E+05	.9825	.2564	43213.7	3436.2	37948.5	9540.1	14937.1	1.187E-06	1.791E-05
26.00	2.096E+06	5.720E+05	7.537E+05	1.0061	.2745	40999.5	3747.4	35786.9	9405.2	15594.5	1.027E-06	1.773E-05
27.00	1.969E+06	5.634E+05	7.855E+05	1.0258	.2936	38881.2	4076.0	33639.2	9271.9	16245.0	8.735E-07	1.753E-05
28.00	1.843E+06	5.549E+05	8.167E+05	1.0414	.3135	36857.3	4422.8	31522.9	9141.6	16885.0	7.297E-07	1.729E-05
29.00	1.721E+06	5.467E+05	8.469E+05	1.0528	.3344	34925.6	4788.7	29454.7	9015.9	17511.3	5.997E-07	1.701E-05
30.00	1.604E+06	5.389E+05	8.762E+05	1.0599	.3562	33083.5	5174.4	27450.5	8896.5	18120.4	4.886E-07	1.668E-05
31.00	1.491E+06	5.315E+05	9.043E+05	1.0627	.3789	31328.1	5580.8	25524.4	8785.2	18706.8	4.022E-07	1.631E-05
32.00	1.384E+06	5.248E+05	9.310E+05	1.0613	.4025	29656.4	6008.8	23688.7	8684.3	19273.3	3.470E-07	1.589E-05
33.00	1.283E+06	5.188E+05	9.564E+05	1.0559	.4271	28069.1	6459.3	21953.6	8596.2	19810.4	3.303E-07	1.542E-05
34.00	1.188E+06	5.138E+05	9.802E+05	1.0466	.4525	26551.1	6933.6	20327.0	8523.6	20317.2	3.602E-07	1.488E-05
35.00	1.101E+06	5.098E+05	1.002E+06	1.0338	.4789	25110.9	7432.6	18814.6	8469.5	20790.5	4.451E-07	1.428E-05
36.00	1.020E+06	5.072E+05	1.023E+06	1.0176	.5061	23741.3	7957.6	17419.8	8437.3	21227.6	5.937E-07	1.362E-05
37.00	9.461E+05	5.061E+05	1.041E+06	.9985	.5341	22439.0	8509.8	16143.9	8430.6	21625.8	8.146E-07	1.289E-05
38.00	8.793E+05	5.067E+05	1.058E+06	.9767	.5629	21200.9	9090.6	14986.3	8453.6	21982.9	1.115E-06	1.211E-05
39.00	8.192E+05	5.094E+05	1.072E+06	.9527	.5923	20024.0	9701.4	13944.9	8510.6	22296.7	1.502E-06	1.126E-05
40.00	7.657E+05	5.143E+05	1.085E+06	.9267	.6225	18905.1	10343.7	13015.8	8606.6	22565.3	1.980E-06	1.037E-05
41.00	7.184E+05	5.219E+05	1.095E+06	.8990	.6531	17841.5	11019.1	12194.5	8746.7	22787.2	2.549E-06	9.439E-06
42.00	6.770E+05	5.323E+05	1.103E+06	.8701	.6841	16830.4	11729.4	11475.3	8936.6	22961.2	3.207E-06	8.484E-06
43.00	6.412E+05	5.461E+05	1.109E+06	.8401	.7155	15869.3	12476.4	10851.9	9182.3	23086.1	3.950E-06	7.522E-06
44.00	6.106E+05	5.635E+05	1.112E+06	.8095	.7469	14955.5	13251.9	10317.7	9490.0	23161.4	4.767E-06	6.569E-06
45.00	5.848E+05	5.849E+05	1.113E+06	.7783	.7784	14086.7	14088.0	9865.8	9866.5	23186.5	5.646E-06	5.645E-06

S GLASS/EPOXY -SPACEWIND-
FIBER COVERAGE RATIO = .750

FIBER PROPERTIES

VF = .5000 EF = 1.260E+07
WF = .6860 EFT= 1.260E+07
RHOF= .0900 GF = 4.000E+05
FTU = 325000.0 AF = 2.200E-06
FCU = 215000.0 AFT= 2.200E-06
UF = .2200

RESIN PROPERTIES

VR = .5000 ER = 4.700E+05
WR = .3140 AR = 4.000E-05
RHOR= .0412 UR = .3500
FSU = 8000.0

COMPOSITE PROPERTIES

RHO= .0492
FTU= 162500.0
FCU= 107500.0
FSU= 8000.0

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	4.901E+06	1.025E+06	1.973E+05	.2850	.0596	121875.0	.0	80625.0	16637.5	4025.6	3.559E-06	1.567E-05
1.00	4.898E+06	1.025E+06	1.987E+05	.2864	.0599	121644.9	6.0	80575.3	16631.5	4228.2	3.556E-06	1.567E-05
2.00	4.887E+06	1.024E+06	2.030E+05	.2907	.0609	120959.1	23.9	80426.0	16613.4	4458.1	3.547E-06	1.567E-05
3.00	4.870E+06	1.022E+06	2.100E+05	.2977	.0625	119831.3	53.9	80176.1	16583.2	4718.0	3.531E-06	1.567E-05
4.00	4.846E+06	1.019E+06	2.198E+05	.3075	.0647	118283.6	95.9	79824.5	16540.9	5009.8	3.510E-06	1.568E-05
5.00	4.815E+06	1.015E+06	2.323E+05	.3201	.0675	116345.2	150.0	79369.2	16486.6	5335.3	3.482E-06	1.568E-05
6.00	4.776E+06	1.011E+06	2.475E+05	.3354	.0710	114051.5	216.4	78808.0	16420.4	5695.7	3.447E-06	1.569E-05
7.00	4.730E+06	1.006E+06	2.653E+05	.3534	.0752	111442.3	295.2	78138.3	16342.3	6091.8	3.407E-06	1.569E-05
8.00	4.677E+06	1.000E+06	2.856E+05	.3738	.0800	108560.2	386.4	77357.1	16252.3	6523.7	3.360E-06	1.570E-05
9.00	4.617E+06	9.937E+05	3.082E+05	.3968	.0854	105449.2	490.4	76461.5	16150.7	6991.3	3.306E-06	1.570E-05
10.00	4.548E+06	9.864E+05	3.332E+05	.4221	.0915	102153.1	607.2	75448.2	16037.4	7493.9	3.246E-06	1.571E-05
11.00	4.473E+06	9.783E+05	3.603E+05	.4496	.0983	98714.6	737.1	74314.4	15912.6	8030.6	3.179E-06	1.572E-05
12.00	4.389E+06	9.695E+05	3.894E+05	.4792	.1058	95174.0	880.4	73057.4	15776.5	8600.0	3.106E-06	1.572E-05
13.00	4.298E+06	9.600E+05	4.205E+05	.5105	.1140	91568.6	1037.2	71675.1	15629.4	9200.6	3.026E-06	1.573E-05
14.00	4.199E+06	9.498E+05	4.533E+05	.5435	.1230	87932.0	1208.0	70166.0	15471.3	9830.5	2.939E-06	1.573E-05
15.00	4.092E+06	9.389E+05	4.877E+05	.5779	.1326	84294.4	1393.1	68529.6	15302.7	10487.6	2.846E-06	1.573E-05
16.00	3.978E+06	9.273E+05	5.234E+05	.6133	.1430	80681.5	1592.7	66766.8	15123.8	11169.9	2.746E-06	1.573E-05
17.00	3.857E+06	9.151E+05	5.605E+05	.6494	.1541	77115.8	1807.4	64879.7	14935.1	11874.9	2.639E-06	1.572E-05
18.00	3.729E+06	9.023E+05	5.985E+05	.6859	.1660	73615.5	2037.5	62872.4	14737.0	12600.2	2.527E-06	1.571E-05
19.00	3.595E+06	8.890E+05	6.375E+05	.7224	.1786	70195.7	2283.5	60750.6	14530.4	13343.1	2.408E-06	1.570E-05
20.00	3.455E+06	8.751E+05	6.771E+05	.7586	.1921	66868.3	2545.8	58522.4	14314.7	14101.8	2.283E-06	1.568E-05
21.00	3.311E+06	8.607E+05	7.173E+05	.7939	.2064	63642.5	2825.1	56197.8	14092.0	14870.5	2.153E-06	1.565E-05
22.00	3.162E+06	8.460E+05	7.577E+05	.8279	.2215	60524.8	3121.9	53789.1	13862.5	15649.0	2.019E-06	1.561E-05
23.00	3.010E+06	8.308E+05	7.982E+05	.8603	.2374	57519.7	3436.8	51310.9	13627.2	16433.3	1.881E-06	1.556E-05
24.00	2.856E+06	8.153E+05	8.387E+05	.8906	.2542	54629.8	3770.4	48779.5	13387.3	17220.0	1.740E-06	1.550E-05
25.00	2.701E+06	7.997E+05	8.788E+05	.9183	.2718	51856.4	4123.5	46213.1	13144.0	18005.5	1.599E-06	1.542E-05
26.00	2.546E+06	7.839E+05	9.184E+05	.9433	.2904	49199.4	4496.8	43631.3	12898.8	18786.2	1.458E-06	1.532E-05
27.00	2.393E+06	7.680E+05	9.574E+05	.9651	.3098	46657.5	4891.2	41054.3	12653.2	19558.4	1.321E-06	1.520E-05
28.00	2.241E+06	7.523E+05	9.955E+05	.9834	.3301	44228.8	5307.4	38502.9	12409.2	20318.3	1.190E-06	1.505E-05
29.00	2.094E+06	7.368E+05	1.033E+06	.9981	.3513	41910.7	5746.4	35997.6	12168.9	21061.9	1.068E-06	1.488E-05
30.00	1.950E+06	7.216E+05	1.068E+06	1.0090	.3733	39700.1	6209.3	33558.2	11934.7	21785.2	9.605E-07	1.467E-05
31.00	1.813E+06	7.070E+05	1.103E+06	1.0161	.3963	37593.7	6696.9	31203.1	11709.3	22484.4	8.719E-07	1.442E-05
32.00	1.681E+06	6.931E+05	1.135E+06	1.0192	.4201	35587.7	7210.5	28948.9	11495.7	23155.4	8.083E-07	1.412E-05
33.00	1.557E+06	6.801E+05	1.167E+06	1.0185	.4448	33678.2	7751.2	26810.1	11297.4	23794.3	7.766E-07	1.378E-05
34.00	1.441E+06	6.683E+05	1.196E+06	1.0141	.4703	31861.3	8320.3	24798.5	11118.1	24397.5	7.843E-07	1.339E-05
35.00	1.333E+06	6.578E+05	1.223E+06	1.0060	.4966	30133.0	8919.1	22923.4	10962.2	24961.4	8.399E-07	1.292E-05
36.00	1.233E+06	6.491E+05	1.248E+06	.9947	.5237	28489.5	9549.1	21191.4	10834.3	25482.5	9.523E-07	1.240E-05
37.00	1.142E+06	6.423E+05	1.270E+06	.9802	.5515	26926.8	10211.8	19606.4	10739.6	25957.7	1.136E-06	1.182E-05
38.00	1.059E+06	6.379E+05	1.291E+06	.9628	.5799	25441.1	10908.7	18169.7	10683.9	26384.0	1.383E-06	1.117E-05
39.00	9.852E+05	6.361E+05	1.308E+06	.9430	.6088	24028.8	11641.7	16880.2	10673.3	26759.0	1.716E-06	1.046E-05
40.00	9.197E+05	6.374E+05	1.324E+06	.9208	.6382	22686.1	12412.4	15735.1	10714.5	27080.2	2.136E-06	9.696E-06
41.00	8.622E+05	6.422E+05	1.336E+06	.8968	.6679	21409.8	13223.0	14729.5	10814.7	27345.7	2.644E-06	8.883E-06
42.00	8.125E+05	6.509E+05	1.346E+06	.8711	.6978	20196.5	14075.3	13857.4	10981.8	27553.9	3.239E-06	8.035E-06
43.00	7.700E+05	6.640E+05	1.353E+06	.8440	.7278	19043.1	14971.7	13111.4	11223.7	27703.6	3.916E-06	7.172E-06
44.00	7.345E+05	6.819E+05	1.357E+06	.8159	.7576	17946.5	15914.3	12483.6	11548.9	27793.7	4.663E-06	6.309E-06
45.00	7.052E+05	7.053E+05	1.359E+06	.7870	.7871	16904.0	16905.6	11965.5	11966.3	27823.8	5.467E-06	5.465E-06

S GLASS/EPOXY -SPACEWIND-
FIBER COVERAGE RATIO = .875

FIBER PROPERTIES

VF = .5000
WF = .6860
RHOF= .0900
FTU = 325000.0
FCU = 215000.0
UF = .2200

EF = 1.260E+07
EFT= 1.260E+07
GF = 4.000E+05
AF = 2.200E-06
AFT= 2.200E-06

RESIN PROPERTIES

VR = .5000
WR = .3140
RHOR= .0412
FSU = 8000.0

ER = 4.700E+05
AR = 4.000E-05
UR = .3500

COMPOSITE PROPERTIES

RHO= .0574
FTU= 162500.0
FCU= 107500.0
FSU= 8000.0

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	5.718E+06	1.395E+06	2.302E+05	.2850	.0696	142187.5	.0	94062.5	22609.4	4726.7	3.559E-06	1.343E-05
1.00	5.714E+06	1.395E+06	2.319E+05	.2862	.0699	141919.0	7.6	94004.9	22600.4	4958.0	3.557E-06	1.343E-05
2.00	5.702E+06	1.393E+06	2.369E+05	.2900	.0719	141118.9	27.9	93831.4	22573.4	5223.5	3.549E-06	1.343E-05
3.00	5.682E+06	1.390E+06	2.453E+05	.2962	.0725	139803.2	52.9	93541.6	22528.3	5526.2	3.537E-06	1.344E-05
4.00	5.654E+06	1.386E+06	2.570E+05	.3049	.0748	137997.5	111.9	93133.9	22465.2	5868.7	3.519E-06	1.344E-05
5.00	5.617E+06	1.381E+06	2.719E+05	.3161	.0777	135736.1	175.1	92606.5	22384.2	6252.7	3.496E-06	1.345E-05
6.00	5.572E+06	1.374E+06	2.899E+05	.3296	.0813	133060.1	252.5	91957.2	22285.2	6679.5	3.468E-06	1.346E-05
7.00	5.519E+06	1.367E+06	3.111E+05	.3455	.0856	130016.1	344.4	91183.4	22168.4	7149.3	3.435E-06	1.347E-05
8.00	5.458E+06	1.358E+06	3.352E+05	.3637	.0905	126653.6	450.9	90282.1	22033.8	7662.2	3.396E-06	1.348E-05
9.00	5.387E+06	1.348E+06	3.621E+05	.3841	.0961	123024.1	572.1	89250.2	21881.6	8217.2	3.352E-06	1.349E-05
10.00	5.308E+06	1.337E+06	3.918E+05	.4067	.1024	119178.7	708.4	88084.5	21711.8	8813.3	3.303E-06	1.350E-05
11.00	5.221E+06	1.325E+06	4.241E+05	.4312	.1094	115167.1	860.0	86782.1	21524.6	9448.8	3.248E-06	1.351E-05
12.00	5.124E+06	1.312E+06	4.587E+05	.4577	.1171	111036.4	1027.1	85340.2	21320.2	10121.7	3.188E-06	1.353E-05
13.00	5.019E+06	1.297E+06	4.957E+05	.4859	.1256	106830.0	1210.1	83756.6	21098.8	10829.8	3.122E-06	1.354E-05
14.00	4.905E+06	1.282E+06	5.347E+05	.5156	.1347	102587.4	1409.4	82029.5	20860.7	11570.7	3.050E-06	1.355E-05
15.00	4.782E+06	1.265E+06	5.755E+05	.5467	.1446	98343.4	1625.3	80158.5	20606.3	12341.9	2.973E-06	1.357E-05
16.00	4.651E+06	1.248E+06	6.181E+05	.5789	.1553	94128.5	1858.2	78144.1	20336.0	13140.8	2.890E-06	1.359E-05
17.00	4.512E+06	1.229E+06	6.621E+05	.6120	.1667	89968.4	2108.6	75988.3	20050.1	13964.6	2.801E-06	1.359E-05
18.00	4.365E+06	1.210E+06	7.074E+05	.6456	.1789	85884.7	2377.1	73695.0	19749.4	14810.3	2.707E-06	1.360E-05
19.00	4.211E+06	1.189E+06	7.538E+05	.6795	.1919	81895.0	2664.0	71269.8	19434.4	15675.1	2.607E-06	1.361E-05
20.00	4.051E+06	1.168E+06	8.009E+05	.7133	.2057	78013.1	2970.1	68720.7	19105.9	16555.9	2.502E-06	1.360E-05
21.00	3.884E+06	1.146E+06	8.487E+05	.7467	.2203	74249.6	3296.0	66057.9	18764.9	17449.3	2.392E-06	1.360E-05
22.00	3.713E+06	1.123E+06	8.968E+05	.7793	.2358	70612.2	3642.2	63294.0	18412.5	18352.1	2.277E-06	1.359E-05
23.00	3.537E+06	1.100E+06	9.450E+05	.8106	.2520	67106.3	4009.6	60444.2	18049.7	19260.8	2.159E-06	1.358E-05
24.00	3.359E+06	1.076E+06	9.931E+05	.8404	.2692	63734.8	4398.8	57525.8	17678.2	20171.5	2.037E-06	1.355E-05
25.00	3.179E+06	1.051E+06	1.041E+06	.8683	.2872	60499.2	4810.7	54558.3	17299.6	21080.5	1.914E-06	1.351E-05
26.00	2.999E+06	1.027E+06	1.088E+06	.8939	.3060	57399.3	5246.3	51563.1	16915.7	21983.8	1.790E-06	1.346E-05
27.00	2.820E+06	1.002E+06	1.134E+06	.9169	.3258	54433.7	5706.4	48562.9	16528.8	22877.1	1.668E-06	1.339E-05
28.00	2.643E+06	9.776E+05	1.180E+06	.9369	.3464	51600.2	6192.0	45581.2	16141.3	23756.1	1.550E-06	1.331E-05
29.00	2.469E+06	9.522E+05	1.224E+06	.9539	.3678	48895.8	6704.2	42642.0	15756.1	24616.4	1.438E-06	1.320E-05
30.00	2.300E+06	9.278E+05	1.266E+06	.9674	.3902	46316.8	7244.1	39768.7	15376.4	25453.5	1.337E-06	1.306E-05
31.00	2.138E+06	9.039E+05	1.307E+06	.9775	.4133	43859.3	7813.1	36983.7	15005.8	26262.9	1.251E-06	1.289E-05
32.00	1.982E+06	8.809E+05	1.346E+06	.9840	.4373	41518.9	8412.3	34308.1	14648.5	27040.0	1.185E-06	1.268E-05
33.00	1.835E+06	8.589E+05	1.383E+06	.9870	.4621	39291.2	9043.1	31760.6	14309.1	27780.4	1.145E-06	1.243E-05
34.00	1.696E+06	8.384E+05	1.418E+06	.9863	.4876	37171.5	9707.0	29357.3	13992.7	28479.7	1.138E-06	1.213E-05
35.00	1.567E+06	8.196E+05	1.450E+06	.9822	.5139	35155.2	10405.7	27111.6	13705.0	29133.8	1.174E-06	1.177E-05
36.00	1.447E+06	8.029E+05	1.480E+06	.9748	.5408	33237.8	11140.6	25033.6	13452.3	29738.6	1.259E-06	1.136E-05
37.00	1.338E+06	7.888E+05	1.507E+06	.9642	.5682	31414.6	11913.7	23130.3	13241.8	30290.5	1.404E-06	1.089E-05
38.00	1.240E+06	7.776E+05	1.531E+06	.9506	.5962	29681.3	12726.8	21405.5	13080.5	30786.0	1.617E-06	1.035E-05
39.00	1.152E+06	7.699E+05	1.552E+06	.9343	.6246	28033.5	13581.9	19860.1	12977.2	31221.9	1.906E-06	9.752E-06
40.00	1.074E+06	7.661E+05	1.570E+06	.9156	.6532	26467.2	14481.2	18492.3	12940.6	31595.5	2.276E-06	9.092E-06
41.00	1.006E+06	7.669E+05	1.585E+06	.8947	.6820	24978.1	15426.8	17297.8	12980.3	31904.5	2.731E-06	8.380E-06
42.00	9.479E+05	7.727E+05	1.596E+06	.8720	.7108	23562.6	16421.2	16270.5	13106.2	32146.9	3.269E-06	7.628E-06
43.00	8.989E+05	7.841E+05	1.605E+06	.8476	.7393	22217.0	17466.9	15402.5	13328.8	32321.1	3.884E-06	6.852E-06
44.00	8.587E+05	8.019E+05	1.610E+06	.8219	.7675	20937.6	18566.7	14684.6	13658.9	32426.0	4.567E-06	6.069E-06
45.00	8.265E+05	8.266E+05	1.611E+06	.7951	.7952	19721.3	19723.2	14106.7	14107.6	32461.0	5.302E-06	5.300E-06

S GLASS/EPOXY -SPACEWIND-
FIBER COVERAGE RATIO =1.000

FIBER PROPERTIES

VF = .5000
WF = .6860
RHOF= .0900
FTU = 325000.0
FCU = 215000.0
UF = .2200

EF = 1.260E+07
EFT= 1.260E+07
GF = 4.000E+05
AF = 2.200E-06
AFT= 2.200E-06

RESIN PROPERTIES

VR = .5000
WR = .3140
RHOR= .0412
FSU = 8000.0

ER = 4.700E+05
AR = 4.000E-05
UR = .3500

COMPOSITE PROPERTIES

RHO= .0656
FTU= 162500.0
FCU= 107500.0
FSU= 8000.0

ALPHA	EX	EY	GXY	UXY	UYX	FXTU	FYTU	FXCU	FYCU	FXY	AX	AY
0.00	6.535E+06	1.823E+06	2.631E+05	.2850	.0795	162500.0	.0	107500.0	29489.2	5436.0	3.559E-06	1.175E-05
1.00	6.530E+06	1.822E+06	2.651E+05	.2861	.0798	162193.1	8.0	107434.4	29476.7	5695.0	3.557E-06	1.175E-05
2.00	6.517E+06	1.819E+06	2.709E+05	.2895	.0808	161278.8	31.9	107237.2	29439.0	5995.5	3.551E-06	1.175E-05
3.00	6.494E+06	1.815E+06	2.807E+05	.2951	.0825	159775.1	71.8	106907.7	29376.2	6341.0	3.540E-06	1.176E-05
4.00	6.461E+06	1.809E+06	2.943E+05	.3030	.0848	157711.4	127.9	106444.5	29288.3	6734.6	3.526E-06	1.176E-05
5.00	6.420E+06	1.802E+06	3.116E+05	.3130	.0879	155126.9	200.1	105845.8	29175.4	7177.9	3.507E-06	1.177E-05
6.00	6.369E+06	1.793E+06	3.327E+05	.3252	.0916	152068.7	288.6	105109.3	29037.5	7671.9	3.483E-06	1.178E-05
7.00	6.308E+06	1.782E+06	3.573E+05	.3396	.0959	148589.8	393.6	104232.4	28874.6	8216.8	3.456E-06	1.179E-05
8.00	6.238E+06	1.770E+06	3.854E+05	.3561	.1010	144747.0	515.3	103212.0	28686.8	8811.7	3.424E-06	1.180E-05
9.00	6.158E+06	1.756E+06	4.168E+05	.3745	.1068	140598.9	653.8	102045.2	28474.2	9455.3	3.387E-06	1.182E-05
10.00	6.069E+06	1.741E+06	4.513E+05	.3950	.1133	136204.2	809.6	100728.7	28237.0	10145.7	3.346E-06	1.183E-05
11.00	5.969E+06	1.723E+06	4.889E+05	.4173	.1205	131619.5	982.8	99259.3	27975.3	10880.6	3.300E-06	1.185E-05
12.00	5.860E+06	1.705E+06	5.293E+05	.4414	.1284	126898.7	1173.8	97634.4	27689.4	11657.3	3.250E-06	1.186E-05
13.00	5.741E+06	1.684E+06	5.723E+05	.4671	.1371	122091.4	1383.0	95851.5	27379.4	12473.0	3.195E-06	1.188E-05
14.00	5.612E+06	1.663E+06	6.177E+05	.4944	.1465	117242.7	1610.7	93909.0	27045.7	13324.9	3.134E-06	1.190E-05
15.00	5.473E+06	1.639E+06	6.654E+05	.5229	.1566	112392.5	1857.4	91806.0	26688.7	14209.8	3.069E-06	1.192E-05
16.00	5.325E+06	1.615E+06	7.149E+05	.5526	.1676	107575.4	2123.7	89543.1	26308.9	15124.7	2.999E-06	1.194E-05
17.00	5.168E+06	1.589E+06	7.662E+05	.5832	.1793	102821.0	2409.9	87122.1	25906.7	16066.5	2.925E-06	1.195E-05
18.00	5.002E+06	1.561E+06	8.190E+05	.6145	.1918	98153.9	2716.7	84546.6	25483.0	17032.0	2.845E-06	1.197E-05
19.00	4.828E+06	1.532E+06	8.730E+05	.6463	.2051	93594.3	3044.6	81822.4	25038.6	18017.9	2.760E-06	1.199E-05
20.00	4.646E+06	1.502E+06	9.279E+05	.6781	.2192	89157.8	3394.4	78957.3	24574.3	19020.8	2.670E-06	1.200E-05
21.00	4.458E+06	1.471E+06	9.835E+05	.7098	.2341	84856.7	3766.8	75961.5	24091.3	20037.2	2.576E-06	1.201E-05
22.00	4.264E+06	1.438E+06	1.040E+06	.7410	.2499	80699.7	4162.5	72848.2	23591.1	21063.4	2.478E-06	1.202E-05
23.00	4.066E+06	1.405E+06	1.096E+06	.7713	.2665	76692.9	4582.3	69632.8	23075.0	22095.6	2.376E-06	1.202E-05
24.00	3.863E+06	1.371E+06	1.152E+06	.8005	.2840	72839.8	5027.2	66333.5	22545.1	23129.7	2.271E-06	1.202E-05
25.00	3.659E+06	1.336E+06	1.207E+06	.8282	.3023	69141.9	5498.0	62971.1	22003.3	24161.6	2.163E-06	1.201E-05
26.00	3.454E+06	1.300E+06	1.262E+06	.8540	.3215	65599.1	5995.8	59568.4	21452.2	25186.7	2.054E-06	1.198E-05
27.00	3.249E+06	1.264E+06	1.316E+06	.8776	.3415	62209.9	6521.6	56150.2	20894.5	26200.5	1.946E-06	1.195E-05
28.00	3.046E+06	1.228E+06	1.369E+06	.8988	.3624	58971.7	7076.5	52742.6	20333.5	27198.1	1.840E-06	1.190E-05
29.00	2.847E+06	1.192E+06	1.420E+06	.9173	.3841	55880.9	7661.9	49372.6	19772.9	28174.7	1.738E-06	1.183E-05
30.00	2.653E+06	1.157E+06	1.470E+06	.9329	.4067	52933.5	8279.0	46067.1	19216.8	29125.1	1.645E-06	1.174E-05
31.00	2.465E+06	1.122E+06	1.517E+06	.9451	.4300	50124.9	8929.2	42852.5	18670.1	30044.3	1.563E-06	1.163E-05
32.00	2.285E+06	1.087E+06	1.563E+06	.9543	.4541	47450.2	9614.0	39753.9	18138.1	30927.1	1.497E-06	1.148E-05
33.00	2.114E+06	1.055E+06	1.606E+06	.9600	.4790	44904.2	10335.0	36794.5	17626.5	31768.6	1.453E-06	1.129E-05
34.00	1.953E+06	1.023E+06	1.646E+06	.9625	.5045	42481.7	11093.7	33994.8	17142.4	32563.8	1.438E-06	1.107E-05
35.00	1.802E+06	9.945E+05	1.684E+06	.9615	.5306	40177.4	11892.2	31372.3	16693.6	33307.8	1.459E-06	1.079E-05
36.00	1.663E+06	9.681E+05	1.718E+06	.9573	.5573	37986.0	12732.1	28941.3	16286.5	33996.1	1.525E-06	1.046E-05
37.00	1.536E+06	9.449E+05	1.750E+06	.9500	.5844	35902.4	13615.7	26712.2	15932.1	34624.4	1.643E-06	1.008E-05
38.00	1.421E+06	9.254E+05	1.778E+06	.9397	.6119	33921.5	14544.9	24691.9	15639.3	35188.7	1.824E-06	9.629E-06
39.00	1.319E+06	9.103E+05	1.803E+06	.9266	.6397	32038.3	15522.2	22883.7	15418.9	35685.4	2.075E-06	9.119E-06
40.00	1.228E+06	9.001E+05	1.824E+06	.9109	.6676	30248.2	16549.9	21287.5	15282.1	36111.2	2.402E-06	8.548E-06
41.00	1.150E+06	8.956E+05	1.841E+06	.8929	.6954	28546.4	17630.6	19906.1	15240.9	36463.5	2.809E-06	7.923E-06
42.00	1.083E+06	8.974E+05	1.855E+06	.8728	.7230	26928.7	18767.1	18715.7	15308.1	36739.9	3.295E-06	7.255E-06
43.00	1.028E+06	9.064E+05	1.864E+06	.8509	.7502	25390.8	19962.2	17726.0	15496.5	36938.7	3.855E-06	6.557E-06
44.00	9.833E+05	9.232E+05	1.870E+06	.8274	.7769	23928.7	21219.0	16921.1	15819.5	37058.4	4.478E-06	5.848E-06
45.00	9.486E+05	9.486E+05	1.872E+06	.8027	.8027	22538.7	22540.9	16289.5	16290.4	37098.3	5.149E-06	5.148E-06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